

# Ignite

Student Intellect and Imagination in

# Mathematics



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## Introduction: Discover Bloom's Revised Taxonomy

**Discover Bloom's Revised Taxonomy—and how its use will ignite students' intellect and imagination in mastering the skills and concepts required to meet educational standards.**

In the 1950s, Benjamin Bloom and his colleagues at the University of Chicago created the Taxonomy of Educational Objectives as a tool for identifying, classifying and qualitatively expressing different kinds of thinking. For decades, it has been one of the most universally applied models across all levels of schooling and in all areas of study. Interestingly, Bloom's Taxonomy has been translated into 22 languages and is one of the most often cited references in the history of education.

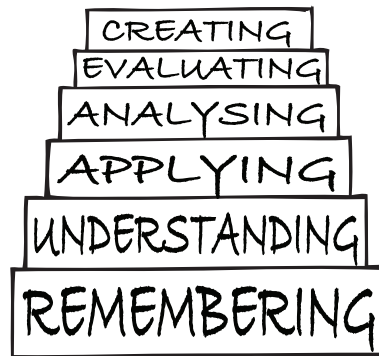
During the late 1990s, a former student of Benjamin Bloom, Lorin Anderson, working with one of his partners in the original work on cognition, David Krathwohl, headed a team of cognitive psychologists to re-examine and update the taxonomy for the emerging 21st century. As a result of their work, a number of significant improvements were made, which included changes in terminology, changes in structure and changes in emphasis. Let's look at each of these changes in more detail.

### Changes in terminology

The original taxonomy of 1956 had six levels of thinking arranged in a hierarchy and stated as nouns. These were, in order from lowest level to highest level: *knowledge*, *comprehension*, *application*, *analysis*, *synthesis* and *evaluation*. In the revised 2000 Taxonomy by Anderson and Krathwohl, there are still six

levels but both the names and the order differ from the original. The names of each level are now "ing" verbs rather than nouns, because thinking is an active process. Likewise,

knowledge was replaced with the word *remembering*, comprehension with the word *understanding* and synthesis with the word *creating*, to better reflect the nature of the thinking defined in each category.



### Changes in structure

Anderson and Krathwohl made two structural changes to the original Bloom's Taxonomy. The order of synthesis (creating) and evaluation (evaluating) has been reversed, because today scholars feel that if the taxonomy is indeed a hierarchy reflecting increasing complexity, then creative thinking is a more complex form of thought than critical or evaluative thinking. In short, one can be critical without being creative, but creative thinking often requires a form of critical thinking through the process of accepting and rejecting ideas as part of the creative process.

Another major structural change to the one-dimensional Bloom's Taxonomy was to add a second dimension in the Anderson/Krathwohl model that identifies and describes the various forms of *knowledge*: *factual*, *conceptual*, *procedural* and *metacognitive*. The chart below illustrates the new two-dimensional model.

# MONEY, MONEY, MONEY

## REMEMBERING

Make a list of currency systems from at least ten countries around the world. Set up your list in two columns: Country Name and Currency Name. Write down the rate of exchange (foreign currency in dollars) for each of these countries and record how each relates to the value of the Australian dollar at this time.



## UNDERSTANDING

Explain this statement so that someone from another country would understand our monetary system: “Australian money is created as a decimal-based currency”.



## APPLYING

Complete this statement: We use dollars and cents in Australia as a currency system for these reasons ... Do some research on the Internet to help you with this task.

## ANALYSING

Compare and contrast the barter system of exchange with our monetary system of exchange. Determine the advantages and disadvantages of each process over time.

## EVALUATING

Verify the intended meanings for these money-related expressions: break the bank, broke, readies, dough, moolah and mint condition.



## CREATING

Imagine you were the producer of a new sitcom titled: “Money Talks!” Write the plot for the first show in the series.



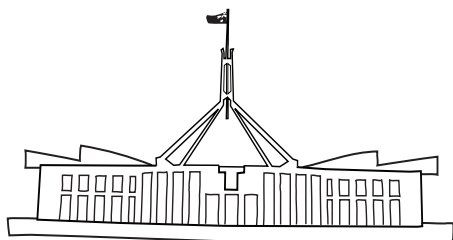
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## Real-Life Application

# Geometry in Architecture

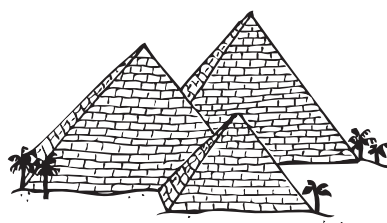
**DIRECTIONS:** Geometry is literally and figuratively the building block of many different types of architecture throughout the world. The purpose of this activity is to investigate and experiment with the figures, shapes and elements of geometry as they relate to real-world architecture.

1. Plan a virtual tour of Canberra for the purpose of visiting several famous monuments and official buildings in our nation's capital. Note what key geometric shapes form the basis of such famous buildings as Parliament House, the National Gallery and the National Library, all situated within what is known as the "Parliamentary Triangle". Download photographs of these sites and write a comprehensive paragraph discussing the "geometry" of each facility's design and the important shapes associated with its construction.



2. Plan a virtual tour of historical and political buildings and monuments in other parts of the world. Consider such places as the Eiffel Tower in Paris, the Pyramids of Egypt and the Taj Mahal in India. Again, note the architectural features of these sites and the geometry

reflected in their design. Download photographs of these interesting places and write a comprehensive paragraph outlining how geometry is the very foundation of their construction.



3. Next, create an original monument or memorial building of your own honouring an important historical person, place or event somewhere in the world. What basic geometric shape will you use and what will it look like? Draw a series of simple blueprints or elevation renderings to show the overall profile and floor plan of your creation.

