STANDARD HUMAN REASONING	SCIENTIFIC ANALYSIS
Goal: to arrive at an accurate conclusion	Goal: to arrive at a well-supported conclusion, based on testing and valid principles, that will stand up to intense scrutiny
Accepts information and concepts from authoritative sources as reliable and valid when gaining knowledge	Doubts and questions all information, concepts and data; tests assumptions by attempting to refute information (i.e., attempts to find situations where the assumptions are false)
Requires minimal testing to arrive at a conclusion	Requires rigorous testing, all identified alternative possibilities are considered and tested
Seeks confirming data to support beliefs, may discount data that contradicts beliefs (referred to as 'ignoring what doesn't fit', 'making a conclusion fit the data' or a 'leap of faith')	Seeks refuting data (falsification) in an attempt to disprove assumptions; acknowledges that unknown alternatives cannot be tested
Discounts or disregards opposing views that conflict with beliefs or long standing views	Values opposing views as a means of improving an explanation or conclusion
Relies on the training, experience and ability of the expert as the deciding factor of sufficiency for acceptance or rejection of data used and conclusions	Relies on tested premises, demonstrable data and correct application of procedures for acceptance or rejection of data used and conclusions; values training and experience as essential in order to apply scientific protocols correctly
The threshold of sufficiency is at the discretion of the expert (tolerance level, confidence level, personal beliefs and opinion)	The threshold of sufficiency is the ability to diminish doubt in others by satisfactorily demonstrating the basis to the point of general acceptance (to include attorneys and jurors): Necessary conditions for an identification are correlation between the items and elimination of alternative explanations (correlation alone is not a sufficient condition to establish causation)
The expert is certain the conclusion is accurate	The confidence of the expert comes from knowledge of scientific principles and proper application of those principles
Allows for personal interpretation of data and conclusions (subjectivity)	Discourages interpretations that cannot be discerned by other reasonable people
Portray concepts and conclusions as proven or conclusive	Portrays concepts and conclusions as being supported by testing (e.g., inferences or reasonable assumptions); the only conclusive concepts are those shown to be false
Attempt to convince others, perhaps with non-data	Attempts to dispel doubt in others by showing the supporting data
Values reproducibility by another expert as sufficient verification -performed blindly is recommended	Values reproducibility for physical events; values sound justification for analytical conclusions -justification cannot be reviewed blindly
Missed identifications are inevitable and labeled as oversights rather than errors	Establishes a tolerance level for acceptable conclusions (i.e., defines an error, an error rate and establishes an acceptable error rate)
False exclusions are tolerated	False exclusions are errors, significance is determined on a case by case basis
Regarding errors: attempts to place blame (incompetent expert)	Regarding errors: attempts to find cause(s) and solution(s) in order to modify suppositions and improve future conclusions
Avoids speculating on hypothetical situations	Allows for speculation as a means of educating others
Trained to competency may be assumed	Knowledge of protocols and the ability to apply protocols is periodically tested
Implements quality assurance measures globally without validation (e.g., implementing a point standard, elimination based on the interpretation of a class characteristic, no unexplainable differences)	Implements validated quality assurance measures specific to a given situation (e.g., additional documentation and/or verification for complex comparisons)

Triplett/Wiese. Standard Human Reasoning vs. Scientific Analysis. Identification News. Vol. 43, No. 4, 2013, pgs. 8-10.