Working Scientifically

Exploring (EE)*:** being open to a phenomenon, going towards it with an inquiring mind, experiencing it and perceiving it from various perspectives; ***Experimenting: trying something out (e.g. touching, tasting, holding, watching), setting up limited situations in which a specific phenomenon can be observed (e.g. burning various substances)
***Tool and equipment use (TE)*:** using tools to explore things more closely (e.g. magnifying glasses) or to engage with things that cannot be touched by hand (e.g. Bunsen burner, glass flasks), or which demonstrate mechanical processes (e.g. pulleys, levers
Recording, reporting and presenting (RRP): observations and discussions are documented in words or images, summarized and shown in informative forms of simplification (e.g. poster, graph)
***Following processes and working systematically (PS)*:** breaking processes down into steps and sequences and trying out a variety of situations (e.g. generating static electricity with different materials),

Direct experience (DE): lived and sensory experience of phenomena (e.g. in the field, in the lab, touching, holding, smelling etc.)
***Noticing (N)*:** paying close attention to certain salient features
Observe (O): looking at somethings systematically over a period of time
***Describing accurately (DA)*:** systematically recalling experiences of phenomena first as mental images (visualizing, or other senses) and then putting this into words and images (sometimes, in gestures)
Identifying and naming (IN): once something is known, being able to recognize it again, name it and recall important aspects of the phenomenon
***Imaginative Visualizing (IV)*:** building accurate mental images of phenomena on the basis of verbal description
***Empathetic identification (*EI):** being able to imagine a phenomenon (e.g. an animal) and identify with how it might feel, move, respond
***Understanding in context (UC*):** being able to relate to a phenomenon and recognize its relationship to its context
***Process Thinking* (PT):** mental ability to imagine real processes over time and in context and how the whole is a meaningful unity or gestalt
Characterizing (CH): being able to bring the observed phenomenon into a meaningful whole and then describing what is typical of the phenomenon (e.g. identifying similarities and differences to other phenomena), identifying commonalities across a range of similar phenomena (noticing the different forms a dandelion can take yet still be a dandelion), before using formal classification terminology
Forming a concept (FC) : students identify characteristic features of a phenomenon and formulate a concept that encompasses these
***Learning a concept /learned concept*(LC):** students learn that a certain phenomenon already has a specific definition within the existing culture and body of knowledge
***Comparing and contrasting* (CC):** describing similarities and differences between phenomena
***Analysing and classifying (AC)*:** examine something methodically and in detail in order to explain and interpret it, and then locate a phenomenon within an existing system of categories
***Ontological observation (OO)*:** observing and describing the properties of a phenomenon, particularly a process to observe its emergence, origins and properties (e.g. observing seeds germinating, plants growing over time and recalling earlier stages)