

Inquiry Teacher Actions and Student's Responses: Essential Features of Classroom Inquiry and Their Variations

Essential Features of Inquiry	1 Full Inquiry Teaching (Can Use Learning Cycle)	2 Coupled Inquiry (Can Use Learning Cycle)	3 Guided Inquiry (Can Use Learning Cycle)	4 Directed Inquiry	5 Verification	6 Expository
1. Learner engages in scientifically oriented questions	Learner poses a question	Learner selects among questions, poses new questions	Learner sharpens or clarifies question provided by teacher, materials, or other source	Learner engages in question provided by teacher, materials, or other source	Learner engages in question that <u>replicates</u> one provided by teacher, materials, or other source	Learner engages in no question to investigate
2. Learner gives priority to evidence in responding to questions	Learner determines what constitutes evidence and collects it	Learner directed to collect certain data	Learner given data and asked to analyze	Learner given data and told how to analyze	Learner given data and told how to analyze that <u>replicates</u> one provided	Learner given no data just conclusions
3. Learner formulates explanations from evidence	Learner formulates explanation after summarizing evidence	Learner guided in process of formulating explanations from evidence	Learner given possible ways to use evidence to formulate explanation	Learner provided with evidence	Learner provided with evidence that replicates conclusions already given	Learner provided with no evidence, only conclusions
4. Learner connects explanations to scientific knowledge	Learner independently examines other resources and forms the links to explanations	Learner directed toward areas and sources of scientific knowledge	Learner given possible connections	Learner provided with connections	Learner provided with connections that <u>replicates</u> one provided	Teacher reports connections
5. Learner communicates and justifies explanations	Learner forms reasonable and logical argument to communicate explanations	Learner coached in development of communication	Learner provided broad guidelines to sharpen communication	Learner given steps and procedures for communication	Learner reports how close to the textbook the conclusions were	Learner reports no conclusions

More _____ Amount of Learner Self-Direction _____ Less

Less _____ Amount of Direction from Teacher or Material _____ More

Dennis W. Sunal (2013), Modified from National Research Council. (2000). *Inquiry and the National Science Education Standards*. National Academy Press, p. 29 and Sunal, D. Sunal, C., Sundberg, C., and Wright, E. (2008). The importance of laboratory work and technology in science teaching. In Sunal, D. & Wright, E. (Eds.), *The impact of the laboratory and technology on learning and teaching science K-16*. Greenwich, CT: Information Age Publishing, 1-28.