TEACHING THE ENGINEERING PRACTICES

Use this overview to see the big picture!

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GRADES K-2	GRADES 3-5	GRADES 6-8
(1) ASK QUESTIONS **Engineers ask questions about problems and needs.**		
Define a problem that can be solved with a tool.	Add criteria/constraints to the design process.	Add scientific knowledge to the design process.
(2) USE MODELS **Engineers use models to visualize and test solutions.**		
Make a model of a familiar object.	Make a model of something new.	Make a functional model that can be tested.
(3) INVESTIGATE **Engineers do investigations to test their designs.**		
Make observations to see if design solves a problem.	Test two models to see which is best.	Collect data using a model in a range of conditions.
(4) ANALYZE DATA **Engineers use data to evaluate and optimize designs.**		
Analyze drawings and writings of observations.	Analyze an engineering problem statement.	Define the operating range of a design.
(5) USE MATH **Engineers use math to represent variables and discover relationships.**		
Describe and compare the attributes of objects.	Measure physical quantities.	Create a mathematical model of a system.
(6) ANSWER QUESTIONS **Engineers design new things.**		
Generate and compare multiple solutions.	Use the design/build/test cycle.	Refine a design and re-test it.
(7) ARGUE USING EVIDENCE **Engineers use evidence to identify the best design.**		
Make a claim about the quality of a solution.	Show how a solution meets requirements.	Support or refute advertised performance.
(8) SHARE INFORMATION **Engineers share designs and methods.**		
Use a diagram to show how a machine works.	Collect and share possible solutions.	Explain the process used to develop a new design.