Oklahoma Science

Engineering

KINDERGARTEN - GRADE 2 K2

1 Engineering Design ETS1

1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. K2.ETS1.1
2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. K2.ETS1.2
3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. K2.ETS1.3

Grade 3 - Grade 5 G35

1 Engineering Design ETS1

1. Define a simple design problem reflecting a need or want that includes specified criteria for success and constraints on materials, time, or cost. G35.ETS1.1
2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. G35.ETS1.2
3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. G35.ETS1.3

Middle School MS

1 Engineering Design ETS1

1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS.ETS1.1
2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. MS.ETS1.2
3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS.ETS1.3
4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. MS.ETS1.4

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Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS.ETS1.1

2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS.ETS1.2

3 valuate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts. HS.ETS1.3

4 Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. HS.ETS1.4