K-2-ETS1 Engineering Design

**Science and Engineering Practices**

**Asking Questions and Defining Problems**
- Asking questions and defining problems in K-2 builds on prior experiences and progresses to simple descriptive questions.
  - Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1)
  - Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)

**Developing and Using Models**
- Modeling in K-2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.
  - Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)

**Analyzing and Interpreting Data**
- Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
  - Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)

**Disciplinary Core Ideas**

**ETS1.A: Defining and Delimiting Engineering Problems**
- A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)
- Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)
- Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)

**ETS1.B: Developing Possible Solutions**
- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2)

**ETS1.C: Optimizing the Design Solution**
- Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)

**Crosscutting Concepts**

**Structure and Function**
- The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

---

**Articulation of DCIs across grade-bands:**

**3-5.ETS1.A** (K-2-ETS1-1), (K-2-ETS1-2), (K-2-ETS1-3); **3-5.ETS1.B** (K-2-ETS1-2), (K-2-ETS1-3); **3-5.ETS1.C** (K-2-ETS1-1), (K-2-ETS1-2), (K-2-ETS1-3)

---

**ELA/Literacy**

**RI.2.1** Ask and answer such questions as who, what, when, where, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1)

**W.2.6** With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1), (K-2-ETS1-3)

**W.2.8** Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1), (K-2-ETS1-3)

**SL.2.5** Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)

**Mathematics**

**MP.2** Reason abstractly and quantitatively. (K-2-ETS1-1), (K-2-ETS1-3)

**MP.4** Model with mathematics. (K-2-ETS1-1), (K-2-ETS1-3)

**MP.5** Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3)

**2.MD.D.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1), (K-2-ETS1-3)

---