#### **STUDENT NAMES: DATE: PER #**

#### ***DESIGN PROCESS GUIDE: CO2 DRAGSTERS – DESIGN STEP 2***

**Engineering** design is a blend of creativity, innovation, and the challenge of solving many problems encountered throughout the process. The process will often require the **engineer** to apply math and science to those solutions. Solving the CO2 dragster problem effectively will require an understanding of some basic physical science concepts, principles, and laws. In Design Step 2, called *Brainstorm and Research*, you will gather information that can be applied in the design process. Your understanding of the following vocabulary and concepts will be a valuable asset to your team, as higher performing solutions will use real *physical science*. You can put understanding of physical science into action in Design Step 2 by **brainstorming** ideas for solving the problem, and then creating **thumbnail sketches** for those ideas. As you brainstorm your ideas with your racing team partners, be ready to talk about these physical science concepts.

**INSTRUCTIONS:** Download this document to your documents folder and save it as ***initials\_co2step2****.* Complete the vocabulary and answer the concept questions. Your teacher will instruct you to upload it for checking when it is completed.

**VOCABULARY LIST:** Enter definitions in the boxes below.

**engineering**-

**aerodynamics**-

**force**-

**mass**-

**gravity**-

**thrust**-

**friction**-

**CONTINUE ON NEXT PAGE**

**inertia**-

**Newton’s Third Law**-

**jet propulsion**-

**DESIGN STEP 1 HYPOTHESIS:** Select a science concept (**CAUSE**) listed below and copy/paste it into the **IF** side of a hypothesis statement. Select a dragster performance outcome (**EFFECT**) that relates to the science concept and copy/paste it into the THEN side of the statement.

 **CAUSE EFFECT**

mass of the dragster is lower, they will not be able to roll.

dragster wheels and axels have more friction, the equal reaction will be low.

CO2cartridgehas low thrust, principle of inertia causes it to stop.

dragster hits a pillow at the end of the track, the dragster will have less momentum.

**STEP 1 HYPOTHESIS STATEMENTS**:

IF the

IF the

IF the

IF the

THEN the

THEN the

THEN the

THEN the

**DESIGN STEP 1 CONCEPT SUMMARY:** In your brainstorming, you should consider physical science concepts in your team discussions and thumbnail sketching. In the space below, explain how you plan on incorporating the science concepts from your research into your dragster designs.

**STEP 1 CONCEPT SUMMARY**:

**END OF THIS TUTORIAL GUIDE. UPLOAD WHEN COMPLETED**