

→ iSTEM activity sheet (p. 1 of 3)

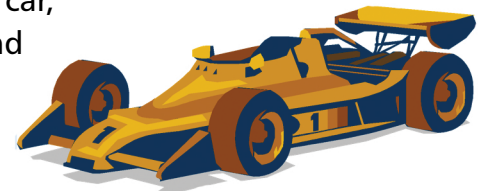
Name _____



Genius Jalopy

Design problem

You and your partner will design, develop, and build a model car, and a seat for a passenger, using given and found supplies and materials, that will be powered by electricity.



Limitations and constraints

These are *some* of the *major* items that you will be graded on:

- Your vehicle must be able to be attached to the race track's guide wire.
- Your jalopy must have a way for the battery pack to be fastened to the chassis of the car so it will not fall off during operation. You cannot glue, tape, nail, etc. the battery pack to the chassis. It must be removed at the end of the class period.
- Your racer must carry a PAT (plastic articulating toy) that cannot fall off of the vehicle during operation of the vehicle.
- Your fuel cell may not be put on or under the PAT (next to the PAT is OK, though).
- You may not alter the motor, but it may be glued to your vehicle.
- And many more we will discover along the way!

Parts

Use the menu board to help you decide which parts to select for building your racer. *Look at the parts carefully!* Each part is different, and each will have benefits and drawbacks of use. Choose your *tradeoffs* wisely. You must the parts on your design sheet that you wish to use. You may exchange parts for different ones as long as they are not damaged. The winning team's vehicle will be entered into the race against Hunt at the end of the school year.

Items to remember

Here are some things to think about and remember when designing and building your racer:

- *Usually, the lighter the car, the faster it will travel.*
- Be creative and think "outside the box."
- Research racecars in books and online, and talk to adults for ideas.
- *Losing a race has no impact on your grade.*
- K.I.S.S.—*Keep it simple, silly!* Do not make a more complicated car than necessary; simple is superb.
- *Have fun!*

Name _____

Smart Car Seat Design

Step 1. Measure PAT. Using a ruler, measure PAT to 1/16-inch accuracy.

- a. Distance from bottom of hips to top of head (height): _____
- b. Distance across hips (width): _____
- c. Distance from back of hips to back of knees (depth): _____



Step 2. List the key features of the seat design. Think about the ergonomics presentation.

- a. Which features do you want to include? Which features *must* be included?

- b. How do your features affect the seat weight? _____



Step 3. Think about your restraint system. What type of seat belt material are you going to use? *Note:* You could use several types.

- a. _____

- b. How will the seat belt fasten to the seat? _____

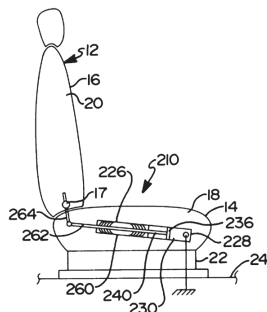
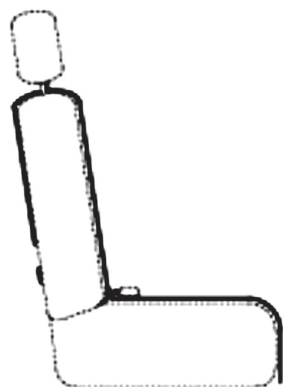
- c. How many fastening points will you have? _____

- d. Why? Describe your reasoning in your choices. _____



Name _____

Smart Car Seat Design



A13 Sport seat w/adj. H/R

Step 4. Sketch your design full size using the measurements from step 1 and a side view of the seat. Please include at least four sketches and label your drawings with the dimensions from step 1.