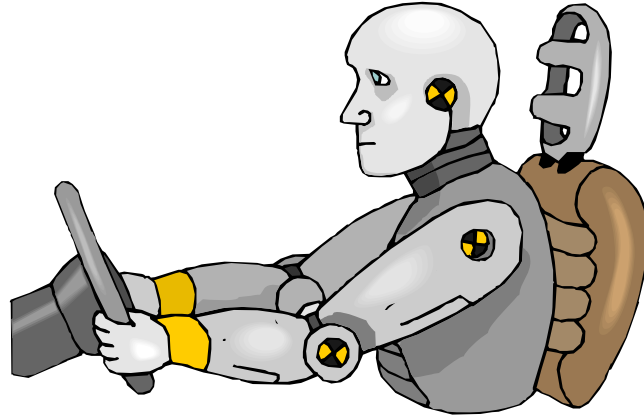


# The Safety Cage

## *Crash Test Structure Design Activity*

### Situation

The design of “crush zones” in automobiles has been established as a means of providing improved safety for the occupants of modern vehicles. These structures provide protection for the passengers of a vehicle by effectively transferring dynamic forces.



Design, construct, and test three identical car frame models that will protect the occupant (one large white egg) from harm during impact at three different velocities.

### Resources

Time	15 class periods
People	Up to 3 per group
Energy	Electrical and human for fabrication, kinetic energy of three different mass weights for testing
Information	Suggested research topics: Momentum, impulse, velocity, acceleration, force vectors, auto frame design
Money	None
Tools	Testing apparatus, hand tools including x-acto knives, saws, any other with teacher permission
Materials	1/8" x 1/4" balsa wood (please conserve), 1/8" dowel rod, 1-3/8" diameter wheels, white Elmer's glue, plastic drinking straws, paper clips, eye hooks, 8-1/2" x 11" paper
Space	The vehicle must be no larger than 6" wide, 4" high, 8" long

### Other Criteria

- The vehicle must have a small eye hook placed on the front center of it at the height of the hole at the end of the track.
- Each of the three vehicles must be identical.

### Required

### Documentation

*The following must be handed in your design portfolio at the end of the activity:*

1. Three or four alternate design sketches completed before building.
2. One final design drawing (to be completed before you receive materials).
3. Records of all tests and adjustments.