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# Build That Dragster

## Dragster to Design, Build and Race

### Situation:

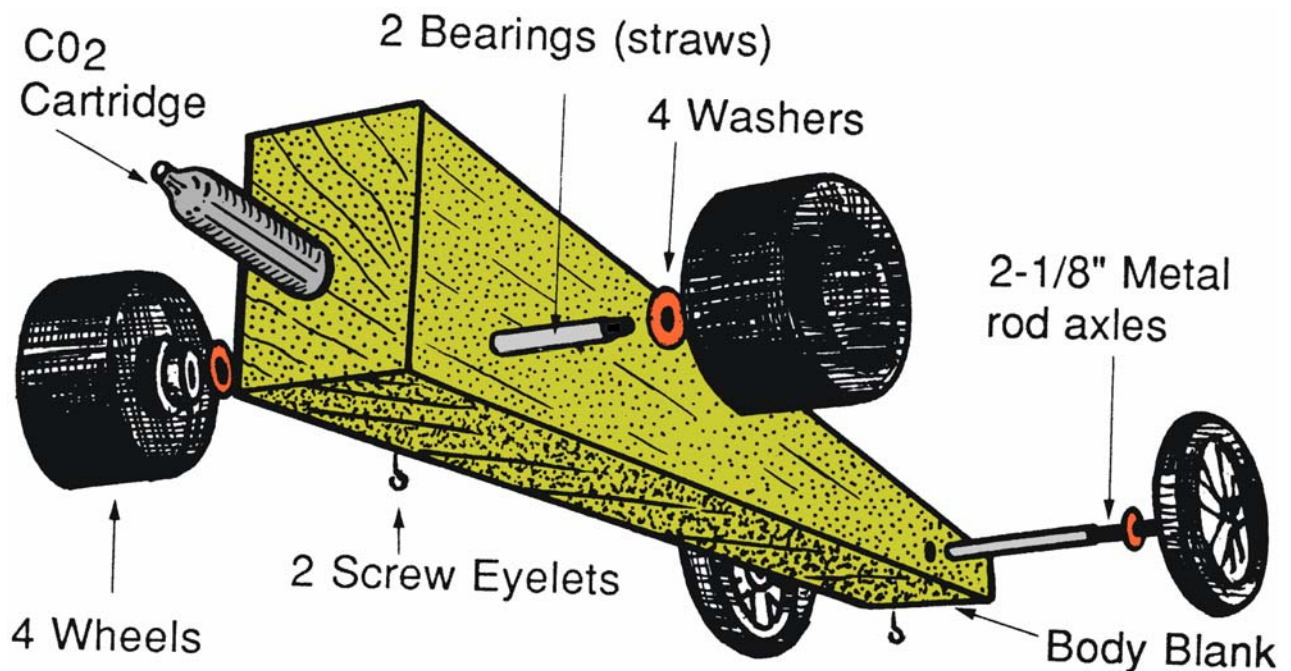
You are going to be entering a race very soon and time is of essence to get started on designing and building a dragster powered by a CO<sup>2</sup> cartridge

### The Challenge:

You will design a dragster with the given dragster limitations based on the Technology Students Association (TSA) Metric 500 Dragster Specifications. Marks earned will be based on the design process including the portfolio, and the finished dragster. A final race during a common lunch will be based on the TSA Metric 500 Rules & Specs. Any competitors falling out of these guidelines will be disqualified to compete. Senior technical students qualified in this area will be judging the race.

### Resources:

Styrofoam blank (\$1.00), a balsa/bass wood blank (\$5.00), moulded front and rear wheels(\$2.00), 2 axles (\$0.25), 4 washers(\$0.40), 2 screw eyelets (\$0.25) and one straw(\$0.10) as your immediate resources. Available tools and equipment around the shop may be used to design, build, and test your dragster. Included in this module is a project guide and a Test and Data Tracking Log Sheet for your construction, testing and records.



### Rough Due Dates:

Research \_\_\_\_\_ 5 Thumbnails \_\_\_\_\_ 2 Ortho Sketches \_\_\_\_\_ Final Ortho \_\_\_\_\_

Prototype \_\_\_\_\_ Production \_\_\_\_\_ Finish \_\_\_\_\_ Race Day \_\_\_\_\_ Final Due Date \_\_\_\_\_



## Project Guide

Step number one should be done when time permits, as it is an outline of what is to be included in your report. Make sure your logo is on all of your work. The rest of the steps should be followed in the order that they come and checked with teacher before moving to the next step as to confirm that you are on the right track.

- 1) **Report:** Put together a report during the process of the project with the usual components showing your project design process including:
  - a) All primary, secondary rough drawings, notes, and information
    - i) One page of research related to project, half text, half illustration
    - ii) One page showing five detailed isometric thumbnails
    - iii) Two orthographic sketches and one final orthographic drawing
    - iv) Full size top and front views of final design on graph paper for template
  - b) Standard sized business tech card
  - c) Presentation advertisement with at least 5 different screen transitions with last page economy printed
  - d) Web page showing highlights of project with print out of page and source code
  - e) Bill of materials, sizes and weight in the form of a spreadsheet
  - f) Bibliography and Resources showing proof of your sources in proper format
  - g) Half a page SPICE and a full page reflection (12 font, 1 ½ line spacing)

All above work must include title, name, date, and course section with electronic media including your tech logo.



## Research:

Here are some suggestions that may be useful to you when research needs to be done.

There are basically two types of research namely pure research and existing information search.

### Pure Research

You are finding out things that have not been found before and therefore are not available in any books or periodicals. This you do by experimentation and keeping careful notes on what you are doing. This

is to make for continuity of your research on a day-to-day basis and also to prove that you actually did it and to validate your findings. Proof is usually your research notes and possibly actual products that you tested (e.g. An example of a new type of airfoil).

### Existing Information Search

This type of information, created others can usually be found in books, periodicals, newspapers etc. You are allowed to use this information providing you recognize that this is not your own information. This you do by clearly indicating where you found this information. A reasonable way of doing this is in the following manner. State where you found it (Name of book, magazine, etc. when it was published and by what organization, and who was the author of this particular article).



### Possible Related Topics:

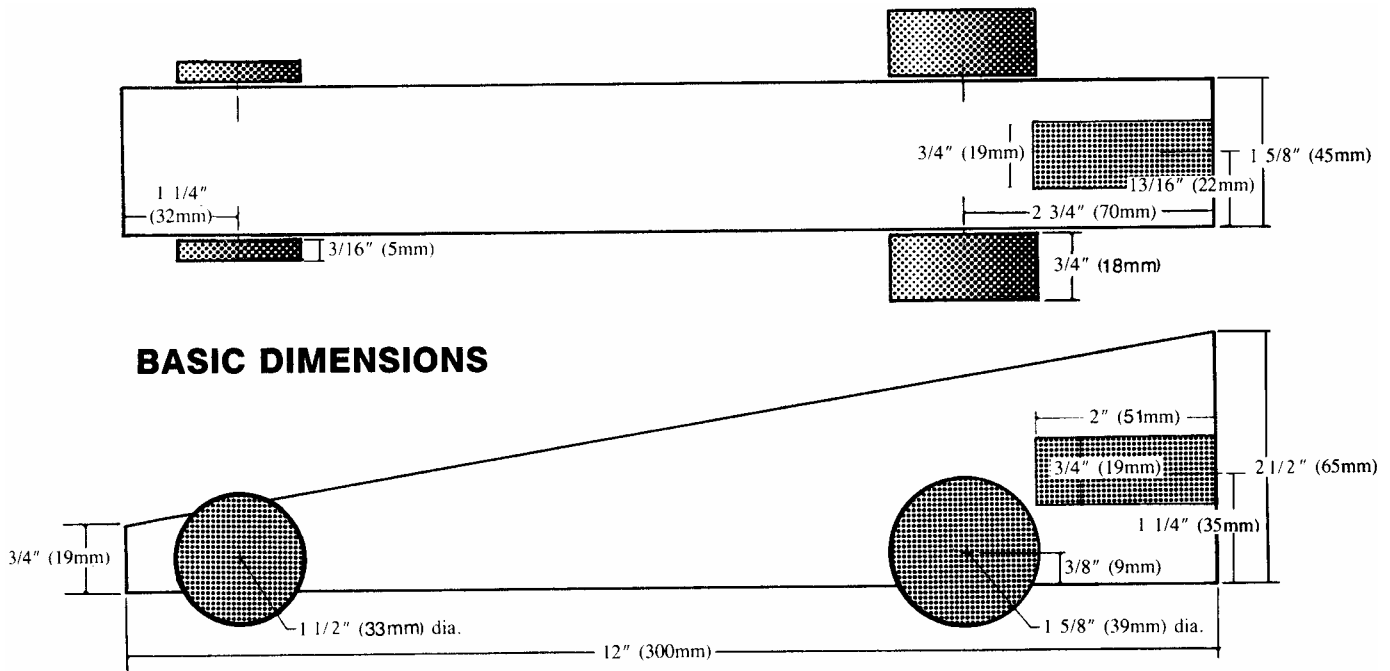
No two topics can be the same when each student signs up for your topic area to research. You will have the opportunity to trade off with a minimum of two peers interested in your topic. Research must be a full page with about half text and half illustration, with your header information on it and bibliography showing your source of information on the back of your sheet in proper format. See library for outline, and/or check the back of a book for examples. Topics must be directed towards a specific area of the CO2 Dragster project that will help peers understand more the technical side to this project. Some main topic areas may be:

1. Aerodynamics
2. Advanced painting
3. Wind tunnel testing
4. Advanced CO2 advanced tips
5. Advanced Corel Draw techniques
6. Plastic injection moulds (wheels)
7. CO2 Dragster operation
8. Competition race details
9. Low moving objects
10. Advanced wood working techniques
11. Rules to watch out for
12. Real dragsters
13. Maximizing dragster speed
14. Dragster body types
15. How to best use prototypes
16. Key to smooth running wheels
17. Best way to market your Dragster
18. Great dragster colour schemes
19. How to put a good report together
20. Research sources for the dragster





## 2. The Specs & Rules: TSA Metric 500 Basic Dimensions and Specifications



FACTORS	LIMITATIONS	
	MAXIMUM	MINIMUM
AXLES (diameter)	3mm	3mm
AXLES (length)	70mm	42mm
AXLES BEARING (diameter)	4.5mm	3.5mm
AXLE HOLE (diameter)	4.5mm	3.5mm
AXLE HOLE (position above body bottom)	9mm	3.5mm
AXLE HOLE (position from either end of body)	100mm	9mm
BRASS SPACER BEARING (diameter)	9mm	7mm
DRAGSTER BODY (length)	305mm	200mm
DRAGSTER BODY (height at rear with wheels)	75mm	56mm
DRAGSTER BODY (mass with wheels)*	170.10g	30g
DRAGSTER BODY (width at axles-front and back)	42mm	35mm
POWER PLANT DEPTH OF HOLE	51mm	51mm
POWER PLANT HOUSING THICKNESS (around entire housing)		3mm
POWER PLANT HOUSING (diameter)	20mm	19mm
POWER PLANT C/L (from body bottom)	35mm	31mm
SCREW EYE (eyelet inside diameter)	5mm	3mm
SCREW EYES (2) on C/L of bottom, distance apart	270mm	155mm
WHEELS, FRONT (diameter)	37mm	32mm
WHEELS, FRONT (width of greatest diameter)	5mm	2mm
WHEELS, REAR (diameter)	40mm	30mm
WHEELS, REAR (width of greatest diameter)	18mm	15mm
WHEELBASE	270mm	105mm

\*Assembled without CO2 cartridge REVISED 08/1/86

- 2) **Specifications:** Study the following TSA Basic Dimensions and Specification Factors and Limitations carefully to have a clear understanding on limitations on dragster design and construction. The official TSA Metric Rules and Specs follow on the next two pages, which must be followed to qualify for the race competition. Dragster cannot be longer or wider then measurements shown.



## Official TSA Metric 500 Rules & Specs

### I. CONTEST PURPOSE

The Metric 500 Dragster Competition is planned to bring the best entries of each chapter together to compete for national honors.

### II. ELIGIBILITY FOR ENTRY

- Entries are limited to two (2) per chapter.
- See "General Rules" for additional information.

### III. LEVELS OF COMPETITION

Level I and Level II as described in General Rules.

### IV. TIME LIMITATIONS

Contestants entry must be available at times specified in the conference program for timed runoffs.

### V. SPECIFIC REGULATIONS

- All entries must be turned in at the time designated. Each contestant will be responsible for obtaining time schedule at registration time.
- A contestant may enter only one dragster that has been self-designed and constructed during the current AIASA year, and not previously entered in National AIASA Competitions.
- All entries must be free of needed repair and/or maintenance at time of check-in.
- CO<sub>2</sub> cartridges will be provided by AIASA.
- Drawings

Every entry must be submitted with a metric drawing of the completed dragster. A two-view (top and side) drawing with metric dimensions shall be made either full scale on 11" x 17" or 12" x 18" paper or half scale on 8½" x 11" or 9" x 12" paper. A three view (top, side and end) drawing is acceptable, but will not change point allocations. Standard engineering procedures/practices should be followed. Drawings may be made using ink or graphite. Originals, blueprint copies will be accepted. Title block will only include "Entry Number \_\_\_\_\_," which will be assigned at registration time, and placed on entry prior to turn-in. (See figure V.E.-1 for example of sheet layout).

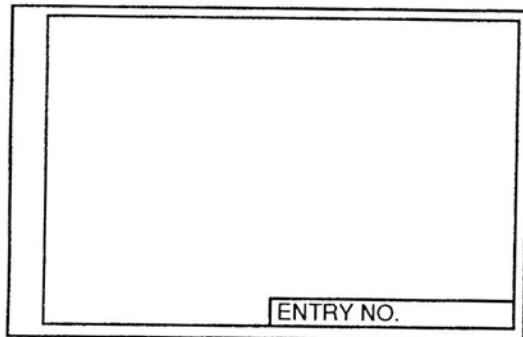


FIGURE V. E-1

### F. Specifications - Body Blank and Dragster

#### 1. Body Blank

- Length - 305 mm
- Front height - 20 mm
- Rear height - 65 mm
- Bottom to center line of power plant chamber - 33 mm
- Body width - 42 mm
- Power plant chamber - 20 mm diameter, 51 mm depth, and drilled parallel to bottom surface. A minimum of 3 mm thickness around entire power plant housing must be maintained on all dragsters for safety purposes. See Figure V. F1f-1

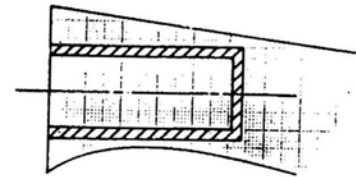


FIGURE V. F1f-1

- The body of the model shall be one piece all-wood construction and no parts such as body strengtheners, fenders, plastic canopy, exhausts, or air foils may be glued or attached to or enclosed within the dragsters. Air foils, fenders and other appearance or designed and engineered in the original body blank. Bearings and lubricants may be used in construction.

2. Dragster	MIN	MAX
a. Axles (diameter)	3 mm	3 mm
b. Axles (length)	42 mm	70 mm
c. Axles bearing (diameter)	3.5 mm	4.5 mm
d. Axle hole (diameter)	3.5 mm	4.5 mm
e. Axle hole (position above body bottom)	3.5 mm	9 mm
f. Axle hole (position from either end of body)	9 mm	100 mm
g. Brass spacer bearing (diameter)	7 mm	9 mm
h. Dragster body (length)	200 mm	305 mm
i. Dragster body (height at rear with wheels)	56 mm	75 mm
j. Dragster body (mass with wheels)*	30 g	170.10 g
k. Dragster body (width at axles - front and back)	35 mm	42 mm
l. Power plant depth of hole	51 mm	51 mm
m. Power plant housing thickness (around entire housing)	3 mm	
n. Power plant housing (diameter)	19 mm	20 mm
o. Power plant C/L (from body bottom)	31 mm	35 mm
p. Screw eye (eyelet inside diameter)	3 mm	5 mm
q. Screw eyes (2) or C/L of bottom, distance apart	155 mm	270 mm
r. Wheels, front (diameter)	32 mm	37 mm
s. Wheels, front (width at greatest diameter)	2 mm	5 mm
t. Wheels, rear (diameter)	30 mm	40 mm
u. Wheels, rear (width at greatest diameter)	15 mm	18 mm
v. Wheelbase	105 mm	270 mm

\*Assembled without CO<sub>2</sub> cartridge

- Dragsters will be disqualified which fail to met the specifications listed in section F.
- Wheels must be made entirely from plastic.
- All contest entries will be judged according to the Metric 500 Rating Sheet, which includes criteria for drawing, design, race, speed, etc.
- No repair or maintenance on entries will be allowed after entries have been registered. Any entry damaged during the race will be judged by the Contest Coordinator to determine whether or not the dragster will be allowed to race again. In the event that the dragster is damaged by conference personnel, the Contest Coordinator will make a ruling as to whether or not the dragster may be repaired by the student entering the dragster. This is the only reason a STUDENT would be allowed to touch his/her dragster after registration. Undamaged wheels which come off during the contest may be replaced as determined by the Contest Coordinator. Damaged wheels may not be replaced.



## Official TSA Metric 500 Rules & Specs Continued

### VI. PROCEDURES

- A. Contestants will register with the Contest Coordinator at the time designated by the Competitive Events Coordinator. (See Conference Program.)
- B. Instructions and contest timelines provided at registration will be followed. It will be the responsibility of each contestant to obtain these for each conference.

### VII. REQUIRED CONTEST PERSONNEL AND EQUIPMENT

- A. Contest Coordinator.
- B. Judges - three (3) or more per level.
- C. Two (2) persons assigned to check in and receive entries.
- D. Person assigned for security.
- E. Room - must be securable for equipment and entries. Size must accommodate an eighteen (18) meter track and equipment. Two (2) rooms optional - one per level.
- F. Tables and chairs for judges.
- G. Tables for entries (at least 6 - 2' x 8' tables).
- H. The length of the drag strip (track) shall be twenty (20) meters (65' 7 1/2") from start gates to timer.
- I. CO<sub>2</sub> cartridges - two (2) per entry, plus spares are needed on site. Provided by AASA at National Conference.

### VIII. CRITERIA FOR JUDGING

- A. Contestants shall be ranked in numerical order on the basis of final score to be determined by each judge without consultation with each other. The winner will be that contestant whose total score is the highest. Other placings shall be determined in the same manner. In case of a tie, the judges shall consult each other to ascertain the winner.
- B. Ratings shall be based upon the following:
  1. Design - 6 points
    - a. Appearance - 3 points
    - b. Finish - 3 points
  2. Drawing - 20 points
    - a. Accuracy - 10 points (dragster will be compared to drawings and specifications)
    - b. Neatness - 2 points
    - c. Dimension - accuracy - 2 points
    - d. Point to point contact/dimension lines - 2 points
    - e. Line quality - 2 points
    - f. Irregular curves - 2 points
  3. Construction/craftsmanship - 14 points
  4. Race - 60 points
    - 1st Place.....60
    - 2nd Place.....56
    - 3rd Place.....52
    - 4th Place.....48
    - 5th & 6th Place.....45
    - 7th & 8th Place.....40
    - 9 - 12.....35
    - 13 - 16.....30
    - 17 - 24.....25
    - 25 - 32.....20
    - All others Run.....10
- C. Contest Coordinator will provide a sealed packet to the competitive Events Coordinator containing the results.
- D. All judges' ratings and results are to remain confidential.

**NOTE.** The top sixteen qualifiers for the double elimination bracket will be determined by the following TSA rules beginning in 1988.

1. Points will be tallied for each dragster in the categories of design, drawing, and construction.
2. Points will be assigned for each dragster's rank in the qualifying round. See VIII B. 4 for points breakdown.
3. Points accumulated in 1 and 2 above will be added together to determine the sixteen entries with the most points.
4. The dragsters with the most accumulated points will advance to the double elimination bracket.
5. After the double elimination bracket races, final entry standings will be determined by adding together the points accumulated in the categories of design, drawing, construction and final ranking in the double elimination race.

### ★ ★ NOTES REGARDING V. F2

#### Item 2a: Axles

Plastic axles such as delrin may be used in competition. However, design elements regarding impact, etc., should be considered when engineering the dragster.

#### Item 2f: Axle Hole

Axles may not be placed closer than 7 mm to either end.

#### Item 2h: Dragster Body (length)

Some student designers/engineers feel that shorter dragsters are faster. However, national contest results prove that length of the dragster is not generally the determining factor.

#### Item 2j: Dragster Body (mass with wheels)

Gross mass does not include the CO<sub>2</sub> cartridge.

#### Item 2k: Dragster Body (width at axles - front and back)

A dragster could be engineered to include a width of 42mm at the front axle and 35mm at the rear axle or vice versa or any distance between the specifications.

#### Item 2m: Power Plant Housing Thickness (around entire housing) Figure V. F1f-1

#### Item 2p: Screw Eyes

Eyelet shall be closed tightly to prevent the line from coming out of the screw eye. On very soft woods the designer/engineer may wish to reinforce the screw eye's hold in the wood with glue.

#### Items 2t and 2u: Rear Wheels

A dragster must have 4 wheels, two of which comply with item 2t specifications and two of which comply with item 2u specifications. The wheels may be placed in position(s) to create the effect of a 2, 3, or 4 wheel dragster.

#### Item 2u: Wheels, Rear (width at greatest diameter)

The specifications dictate that the wheel's surface contact is the point of measurement. See Figures VF2u-2.

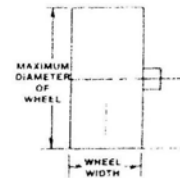


Figure VF2u-2

The wheel designs shown in VF21-3 will not be legal:

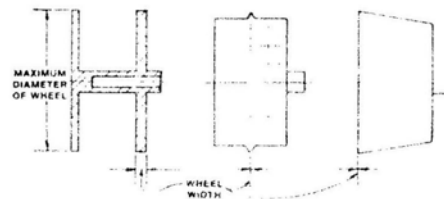
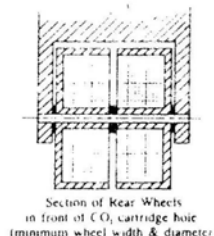


Figure VF21-3

### COMMENT ON VF2a-v

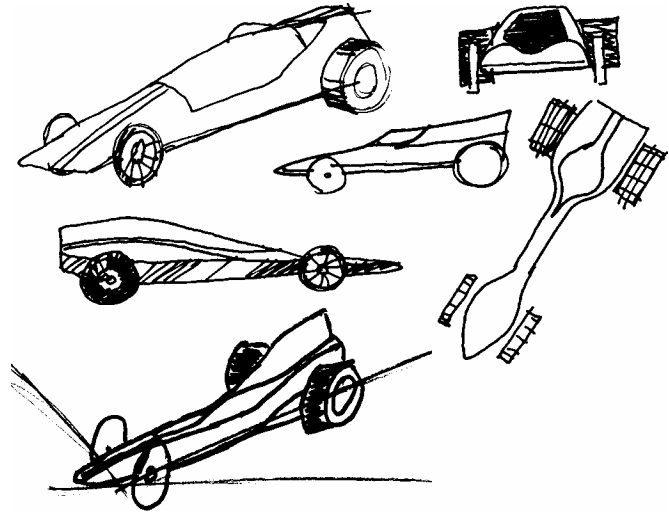
Specifications now allow designs in which wheels may be located inside the car body. Example:



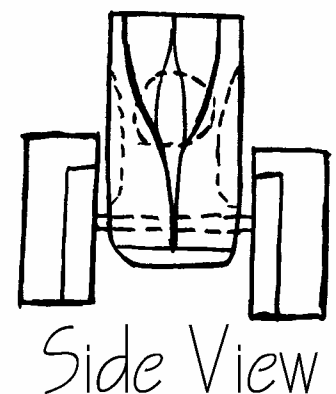
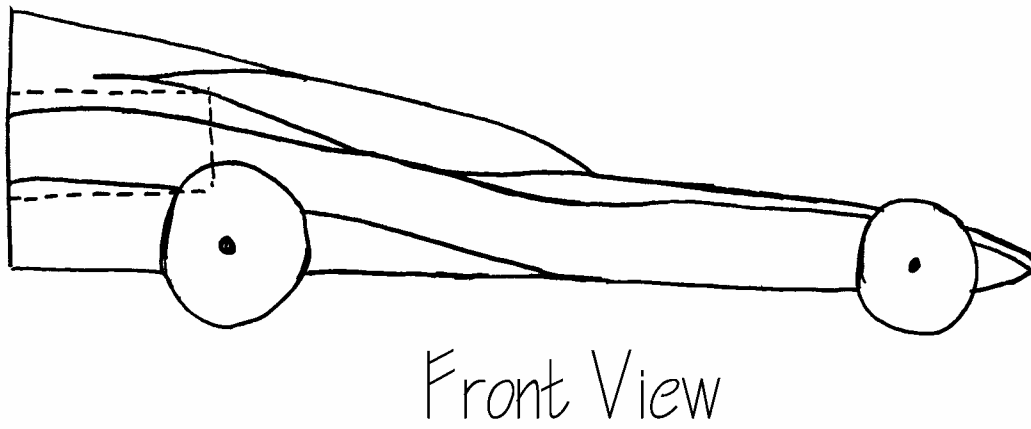
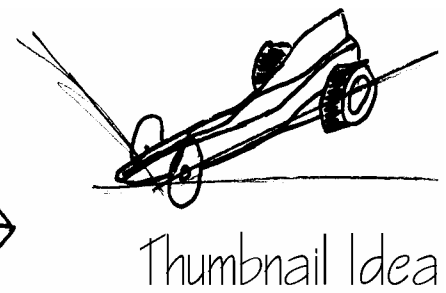
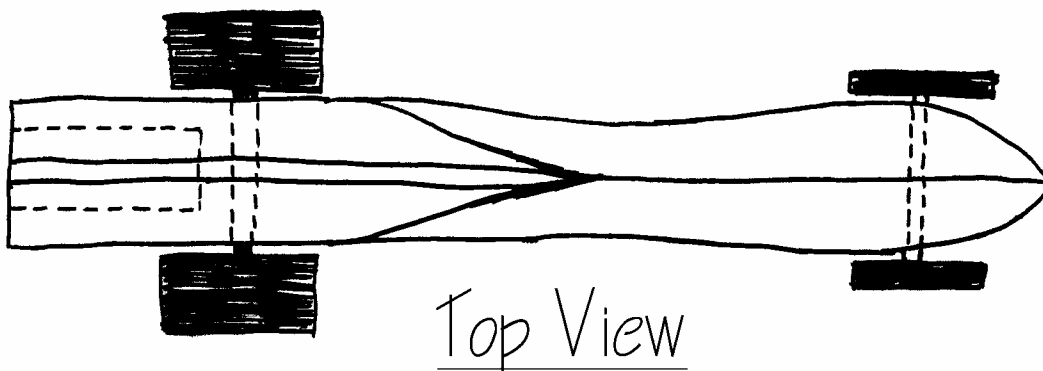




- 3) **Thumbnail Sketches:** a minimum of five detailed isometric thumbnails showing different dragster shapes, styles and sizes keeping in mind the dragster limitations set by TSA.



- 4) **Ortho Sketches:** two neat orthographic full-page, landscape format drawings showing your chosen isometric thumbnail in the upper right corner. Remember these are just sketches, no ruler is necessary. If you wish you may use graph paper.





# Integrated Technologies

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Name:

Date:

Section #

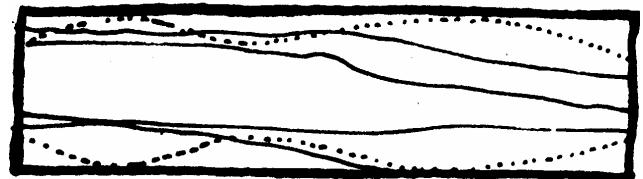
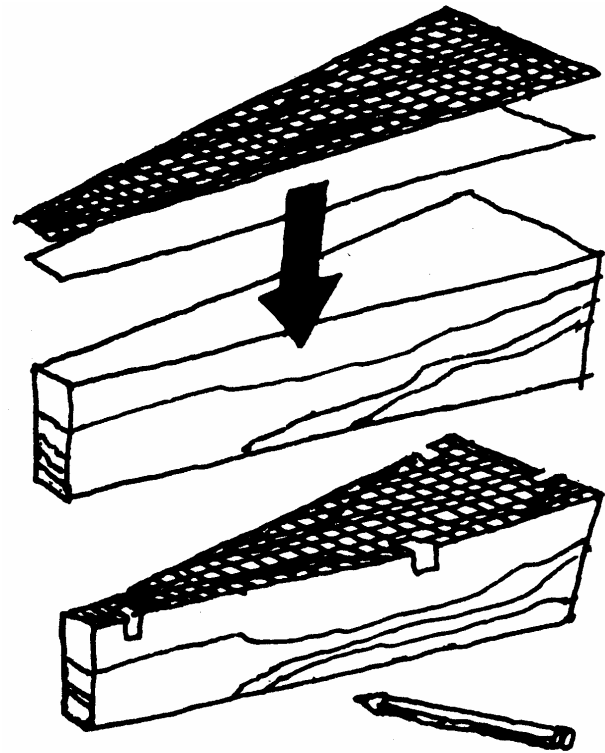
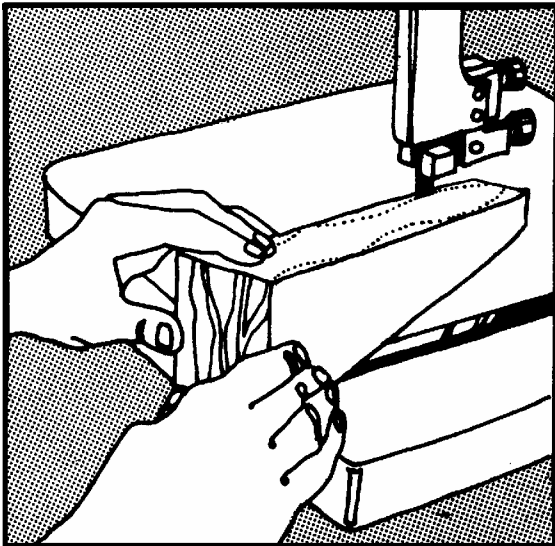
- 5) **Finished Drawing:** Make a top and front view ortho drawing showing one or a combination of your proposals, that you feel will be most suitable for a single final "working design". This will be used as a template for your prototype. Be aware that you may want to make design changes as you further develop and test your prototype, as it is rarely working perfectly the first time. Remember to have a rough for your research topic completed.

Graph is made with 5 mm guidelines. I F Productions

Western Technical-Commercial School	Title:.....	SAMPLE DRAGSTER		Drawn By: .....MR. M. FRANZEN.....
	Material:.....	BALSA WOOD, PLASTIC, AND STEEL		Course: .....TTI 100.01.....
		Scale:.....1:1.....	Date: .....MAY 30, 00.....	DWG. 001

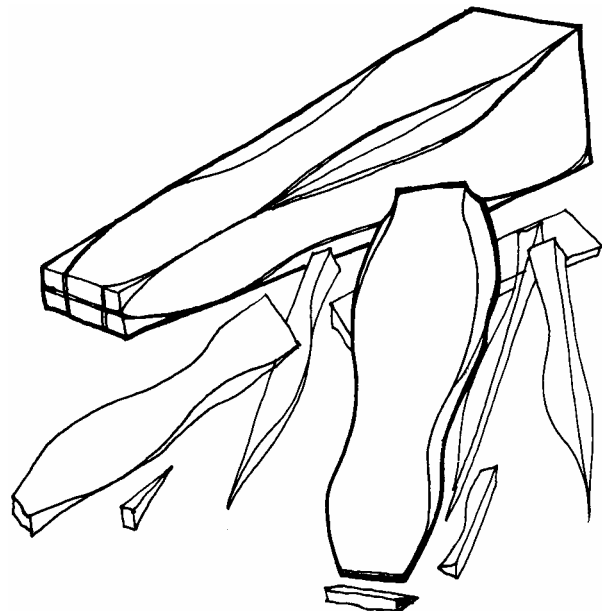


6) **Prototype:** Using your top and front view template you can then transfer your working design pattern to the Styrofoam blank to create a working prototype. This will help you visualize and test for possible improvements and modifications. You must have at least one Styrofoam prototype showing final shape, size, and colour with accommodating orthographic drawing showing top and front orthographic view, either on the computer or on graph paper. Further Styrofoam blanks could be purchased for one dollar, to try new ideas or further investigation.



a) Points to Consider:

- i) Double check that your front and rear axle are with-in the limitations set by TSA
- ii) Check CO2 housing thickness in order to safely launch Dragster (3mm minimum).
- iii) Drill your axle holes first prior to cutting out vehicle in order to keep them straight
- iv) Transfer the pattern with the least amount of curves, usually the front ortho view, onto the Styrofoam blank and cut out, then transfer the other ortho view pattern to finish, usually the top view to cut.
- v) File/sand down roughed shape to working design drawn orthographic idea





# Integrated Technologies

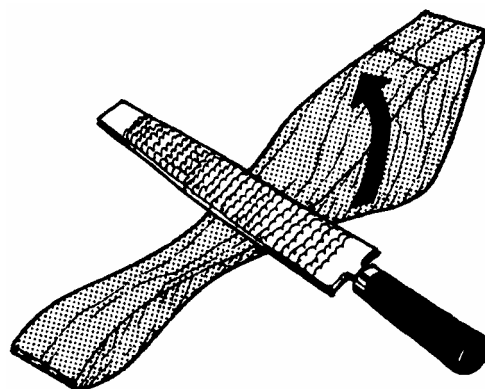
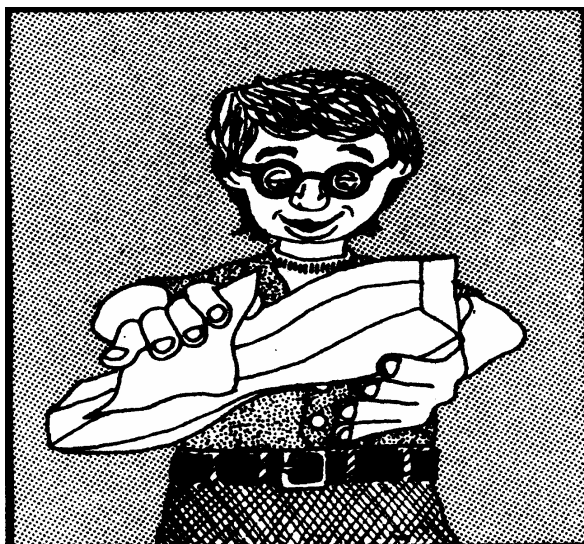
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- 7) **Production:** Once you have a prototype "working design" that you feel will work, take your latest top and front view orthographic template design and cut out your wooden dragster. Keep in mind the steps you followed to cut out the Styrofoam prototype. Remember measure twice, cut once! Sand down to a smooth finish to prepare for a final finish as done in the past.
- 8) **Finishing Vehicle:** with a primer and coloured paint, or

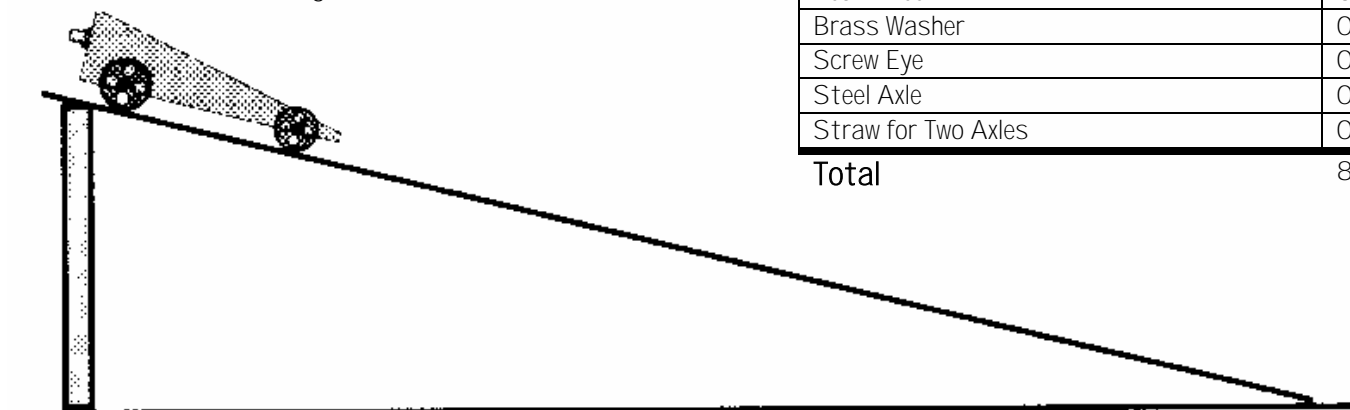


natural with or without a stain including a minimum of three coats of varathane. Spray paint may be used after the base colour coat has been put on. Advanced painting techniques will be available on request. Your logo must be either painted or marked on to identify your vehicle quickly and easily. Allow at least three days to complete painting process with night drying recommended.

- 9) **Testing Vehicle:** should be done after the dragster is put together and log test information in the Test and Data Tracking Log. Several tests can be done including the following:

- a) **Weight Test**
- b) **Ramp Test**
- The degree of friction in the axles and bearings by recording distance traveled
  - How straight the wheels are aligned and how far off centre at 1 meter from edge of ramp
  - Time it takes to get to the 1 meter mark

<i>Dragster Kit Material and Cost Break-Down</i>	
Material Description	Cost in \$
Styrofoam Blanks	1.00
Basswood Blanks	5.00
CO2 Cartridge	1.00
Front Wheel	0.45
Rear Wheel	0.55
Brass Washer	0.08
Screw Eye	0.13
Steel Axle	0.13
Straw for Two Axles	0.10
<b>Total</b>	<b>8.44</b>







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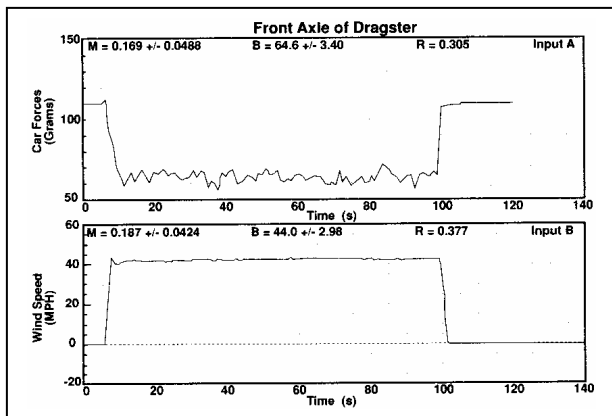
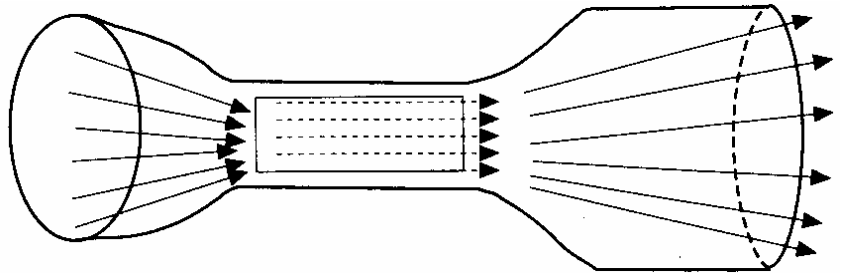
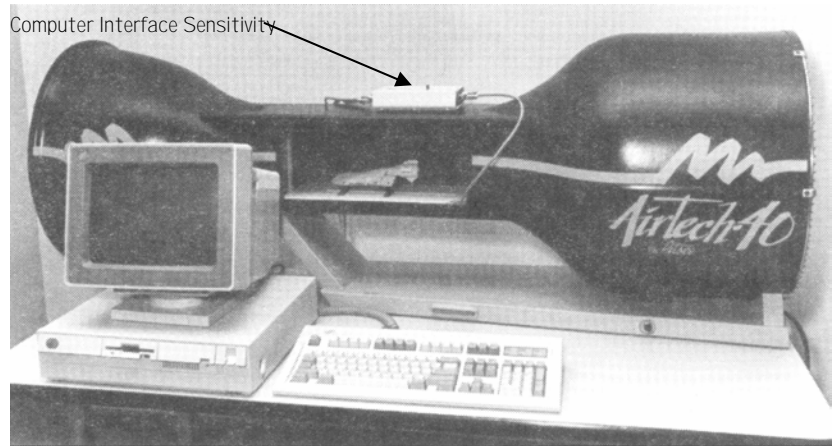
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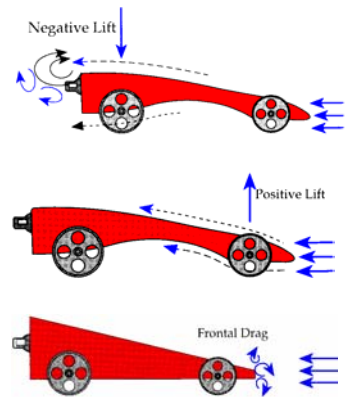
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- c) **Wind tunnel Test:** It is important to be familiar with the Airtech 40ic wind tunnel system before using. A manual is located beside unit so that you may follow instructions on proper use. Normally wind speed, drag, front axle and rear axle force will be already calibrated and ready to use. If wind speed measured is not around 40 miles per hour, the computer interface sensitivity adjustment has been tampered with. To get accurate readings it may be necessary to re-calibrate all of the elements. The moral of the story is **DO NOT TOUCH THE COMPUTER INTERFACE SENSITIVITY DIAL**. The following four forces should be measured and recorded

- (1) Wind Speed
- (2) Drag Force
- (3) Front Axle Force
- (4) Rear Axle Force



- d) It is a good idea to get a real time graph showing the different elements that you want to observe, and then print up the graph.



- 10) **The Race:** Once this is complete you are ready to race your dragster. The race will start by racing

each dragster individually. Each dragster will be given a rank according to speeds ranging from fastest to slowest times. Test and Data Tracking Sheet must have a different peer marker than the final evaluation sheet.

If you are not sure of how a certain process is done,  
please ask for assistance!

Remember: Check with teacher after each step!



## RACING TERMS, NICE TO KNOW (for your own info)

- A Bone: A Model A Ford
- Back Off: Reduce or slacken speed or power.
- Bad News: Dragster that performs well thus "bad news to the competition.
- Big Bangers: Cars with engines of large cylinder displacement.
- Big Wienie: Winning driver in drag races.
- Bite: Traction of tires on the racing strip.
- Blow: Failure of the engine.
- Boondocks: Off the course. "He headed for the boondocks."
- Boots: Tires.
- Bore: Diameter of an engine's cylinders.
- Broke: Washed out of a drag meet because of vehicle failure. Out of competition.
- Carry the Wheels: Doing a wheel stand (Wheelie).
- Christmas Tree: Drag strip starting light.
- Cornering: Good cornering is when the car holds the road firmly without swaying or leaning noticeably.
- Cutoff Point: The physical location on the track, before each corner, where the driver takes his foot off the throttle and puts it hard on the brakes; subject to the adjustment according to brake performance and intensity of competition.
- Deuce: A 1932 Ford. Still an ideal stock car for converting into a street dragster.
- Dicing: (British) Close, exciting and highly competitive driving. Drag or Dragging: A race to get to the fastest possible speed per hour over a quarter mile distance.
- D-Ring: The pull ring (or handle) for opening the safety chute at the end of the drag run.
- Drop the Hammer: To engage the clutch very rapidly at the start of the race.
- Elapsed Time: The total time it takes to drive the quarter mile. Given in seconds and fractions of seconds.
- Eliminated: Out of the meet; beaten.
- Flat Out: Full speed; straining to reach the maximum possible.
- Foul: To leave the starting line before getting the green light and so getting the red "foul" light.
- Four On the Floor: Stick shift for transmission with four forward gears.
- Full Bore: Full speed; wide-open throttle.
- Goodies: Fancy body ornaments on a customized car.
- Gran Turismo: (Italian) Closed two-seat coupe designed for rapid, comfortable touring with good performance and handling.
- Grease Monkey: Garage or auto shop employee who does unskilled work. Good apprenticeship for a would-be mechanic.
- Hack: A hot rod.
- Hairpin: Acute corner on road racing circuit.
- Handier: Drag race driver.
- Hauler: Extremely fast car.
- Honker: Extremely fast car.
- Hot Dog: (1) Said to be main diet of drag fraternity; (2) to show off; a winning driver.
- Hot Shoe: A fast capable driver.
- Injected: Engine with fuel injection.
- Juice: Fuel specifically blended for race cars.
- Lunched an Engine: An engine completely destroyed or failing completely during a race.
- Match Race: Race in which winner must take two out of three drag runs (or three out of five).
- Mickey Mouse Circuit: Small, winding, race circuit.
- Moon: Hubcap. Nerf Bar: Bumper.
- Off the Line: Actual start of the race.
- Pace Car: Vehicle used to pace race cars at flying start.
- Pin striping: Painting narrow stripes at handles and other parts of car's body.
- Pipes: Fancy exhaust system.
- Roll bar: Bar firmly installed on racing vehicles to protect driver in case the car rolls over.
- Screamer: A hot rod.
- Shaving: Removing body trim preliminary to customizing
- Sleeper: Car with more horsepower and getaway than you would expect by just glancing at it.
- Slick: Oversized tire for better traction. Usually wide and flattened where it contacts the road surface.
- Stand on It: (1) To step all the way down on the throttle pedal. (2) To race aggressively.
- Stock Car: A drag racing class. Top: Top Eliminator.
- Zoomies: Exhaust headers on a dragster that sweeps upward, thus directing smoke and heat away from vehicle and driver.



## Test and Data Tracking Log Sheet

Dragster Number \_\_\_\_\_ Peer Checker \_\_\_\_\_

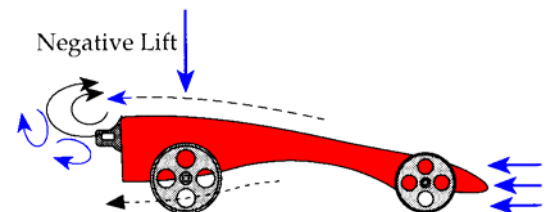
Body Style (circle one)



Front Wheel type (Plastic injection, standard, custom): \_\_\_\_\_

Rear Wheel type (Plastic injection, standard, custom): \_\_\_\_\_

Design Phase →	Limitations		Initial Tests		Final Tests		
Measurements in mm or grams or meters/sec	Max.	Min.	1 <sup>st</sup>	2 <sup>nd</sup>	Self	Peer	Teacher
Roll Test Distance							
Roll Test Off Centre to right or left							
Roll Test time for 1 meter							
Drag Force (g)							
Front Axle Force (g)							
Rear Axle Force (g)							
<div> </div>							
Check Your Specifications							
AXLES (length)	70	42					
AXLES BEARING (diameter)	4.5	3.5					
AXLE HOLE (diameter)	4.5	3.5					
AXLE HOLE (position above body bottom)	9	3.5					
AXLE HOLE (position from either end of body)	100	9					
BRASS SPACER BEARING (diameter)	9	7					
DRAGSTER BODY (length)	305	200					
DRAGSTER BODY (height at rear with wheels)	75	56					
DRAGSTER BODY (mass with wheels)*	170.10g	30g					
DRAGSTER BODY (width at axles-front and back)	42	35					
POWER PLANT DEPTH OF HOLE	51	51					
POWER PLANT HOUSING THICKNESS (around entire housing)		3					
POWER PLANT HOUSING (diameter)	20	19					
POWER PLANT C/L (from body bottom)	35	31					
SCREW EYE (eyelet inside diameter)	5	3					
SCREW EYES (2) on C/L of bottom, distance apart	270	155					
WHEELS, FRONT (diameter)	37	32					
WHEELS, FRONT (width of greatest diameter)	5	2					
WHEELS, REAR (diameter)	40	30					
WHEELS, REAR (width of greatest diameter)	18	15					
WHEELBASE	270	105					

[illegible]





## Check List for Project Module

When handing in everything, double check prior to handing in by checking off the following items with work in respective locations. Roughs in left pocket, Process and module info in right pocket, and your final papers in centre:

↓ Related Notes:

- ☐ Report cover with title page, business tech card, and table of contents
- ☐ Module information
- ☐ All related rough work and additional notes
- ☐ \* Research –yours and 2 of your peers as a minimum
- ☐ \* 5 isometric thumbnail ideas,
- ☐ \* 2 full page detailed orthographic and isometric sketches
- ☐ \* 1 full page detailed orthographic drawing
- ☐ \* Final full scale front and top view drawing
- ☐ Information log tracking sheet filled out
- ☐ Material sheet using Quattro Pro
- ☐ Presentation Advertisement with 5 transitions with final economy print
- ☐ Web page showing CO2 car project highlights
- ☐ SPICE ½ a page related to this project
- ☐ Finishing up with a 1 page conclusion reflection of project and course
- ☐ This check list- with items completed and included, checked off
- ☐ Final self and peer evaluation paper completed
- ☐ Diskette holder and diskette with your files saved in proper conventions

\*All due date components handed in will have the teachers initial along with a plus #, OT, or minus # showing if they were completed on time with dates on front. These positive and negatives will directly affect your mark.



## Index of Key Terms and Phrases:

Find ten new key terms or phrases and include the page number in the table below:

	<u>New</u> Key Terms or Phrases	Page #
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



## Project Evaluation Sheet Project Due \_\_\_\_\_

How great was it? \_\_\_\_\_

Peer Marker: \_\_\_\_\_

Note Peer marker must be different than in Test and Tracking Data Sheet.

### Activity Process and Product Steps

Activity Process and Product Steps	Total Marks	Self Mark	Peer Mark	Earned Marks
<u>Requirements Met:</u> Finished dragster 1) Research paper 2) With-in specs of TSA limitations 3) Presentation advertisement and Web page of dragster project 4) Spreadsheet showing materials, sizes, and weight 5) Report, project box, logo, related information	10			
<u>Research and Information:</u> 1) Research paper done, included 2 peer research papers. 2) Resources and bibliography 3) Test and Data Tracking Log Sheet complete	15			
<u>Solutions: rough Ideas: Rough Designs:</u> 1) Research, notes, diagrams, illustrations, etc. 2) Dragster isometric thumbnails, ortho sketches and prototypes 3) Presentation advertisement- rough notes, rough illustration, 5 transitions 4) Spreadsheet- material lists, supplies, amounts, sizes, and weight etc.	25			
<u>Final Design: Solution:</u> 1. Your final scaled orthographic drawing 2. Presentation advertisement with 5 transitions and Web page	10			
<u>Workmanship: Construction: Product:</u> 1. Dragsters practical, with-in limits, efficient, well put together 2. Bill of materials, weight, prices and sizes in the form of a spread sheet 3. Report well put together	20			
<u>Finished Product: Solution:</u> 1. Final product look, eye catching, aerodynamic and colourful 2. Portfolio completion, process all present including reflection 3. Number in class races _____ Best Legal Race time _____ 4. Test and Data Tracking Log Sheet including final race place _____ If you had to do this project again, what would you change or include: _____ _____	20			

Final mark: \_\_\_\_\_ Students: Total up your marks →

Based on % finished and completion and fulfillment of requirements of the problem

100