**Air Trajectory**

Graphs that are useful

Heavier (upto 5 kg) ball for Div B – can use different weights for different distances

Energy change – pump compresses and then releases

Has to come back by itself

No electricity or laser to be used

Plot for every 5cm for better accuracy to be able to adjust for different distances

Goggles

Different masses for 2 targets – can change projectiles

Bucket dimensions – to be announced

Make a small device so you can move it around easily

Mass to hit the bottom of the bucket directly for maximum points

-Indoors, uses gravitational force

- Bring graphs from your practice runs to the competition, very useful (2b)

**Disease Detective**

Population Growth

Epidemiology

See handouts – Very useful

[www.soinc.org](http://www.soinc.org) has training handouts on:

-water quality

-air pollution

-food quality

-healthcare

Practice tests

CDC outbreak app – free

Resources: Prepare using Wikipedia tests, Disease detective CD is very useful

**Entomology**

Same as last year

Identify specimen

Bring your own magnifying glass

**Crime Busters**

Safety rules are important

Dispose chemicals properly

Good problem solving skills

Prepare early and practice

Tips: a. Work on logical reasoning for crime solving

b. Practice identifying substances/fabrics

c. Prepare testing kit well before the competetion

**Green Generation**

Air Quality

Water Quality

Wikipedia – a good source

1B – Environmental Science Course

Tips: - Written exam, and not a Hands-on Event

* Pack as much info as possible
* Topic info from International Baccalaureate’s Environmental Science Course

**Dynamic Planet**

Resources:

* Wikipedia – Oceanography
* Scioly.org
* Noaa.gov/ocean.html
* Csun.edu/science/geoscience/oceanography/index.html

National Oceanic and Atmospheric Administration

Vrneer or Pascal – good places to lone instruments without any charges

**Anatomy**

Integumentary System

Immune System

Cardiovascular System

**Bridge Building**

Lonestar Balsa – Best wood to buy, buy Harder wood 7-10 lb/cu.ft

Laminating wood is a good idea (gluing 2 pieces of wood together)

Grain A, B, A/B

Pistco Cap filling CA glue, insta curet – Best glue,

Get centigram scale

Put sand in – build heavy first

Resources: scioly.org; Youtube has good examples of bridges

7 – 10lbs of wood – denser wood

3M adhesive

Another good idea – use carbon fiber with fasteners 5mm – Mylar covering

Model Airplane Co.

**Write it do it**

Writer - details as much as possible

Pre-set abbreviations are ok as long as they are stated in the key in the beginning eg., TP – toothpick, AC – anticlockwise, C - clockwise

No symbols, \* is ok

Some coach shared that they use writing format as placing text where the object is being placed in the model for easy reading – but please check and verify if that would not be considered as diagramming

Eg., Text A

\*Text B Text C

 Text D

**Experimental Design**

Goggles required

Diagrams are good

Graphs

Statistics – average, median, mean, mode, standard deviation

Calculators allowed

TIPs: - Mostly Physics, chemistry is Rare

* Focus on simple experiments,
* Practice on completing rubric
* Diagrams are VERY IMPORTANT

**Fossils**

DO Bring your own magnifying glass (1 PER TEAM)

Lab Stations format, Teams move from 1 station to the next in a timed manner

**Can’t judge a powder**

Write every observation – NEED good observation skills

Kit of supplies for each student

**Road Scholar**

Some maps are small and difficult to read

Find out if magnifying glass is allowed

**Bio Process Lab**

Lean how to adjust microscopes

Genetics

Study slides

Bio lab needed

Very Broad syllabus

Will have Lab stations

**Wheeled Vehicle**

High penalties! Follow the RULES – MOST CRITICAL !

Rigid frame

Lighter wheels – balance

Tip – precision disc mount wheel

Resources: DrFizzix.com; servocity.com

DVD box plastic cover – good as wheels

Tips: Rigid body, lighter wheels, Balance

**Robo-Cross**

Best to rely on kits: Vex Robotics or Lego Mindstrom Kits

Lesser the time, better the score

Technical documents

Keep extra batteries in case they run out

Used Vex Kits are available on eBay at a much cheaper price

**Picture this**

Glossaries of science textbooks are useful

Similar to PICTIONARY

**Elastic launched glider**

Goggles

At least 3.1 grams (make it AS LIGHT AS POSSIBLE WHILE STILL MEETING the > 3.0 g RULE)

Launch at an angle

Best is when the plane goes up and smoothly turns and comes down

Freedomflightmodels.org – Dave

Don’t open the doors during flight and make sure no fans are on

School gyms are best for practice

Tip: Make use of the height of the room: Gym ht. ~35 ft

**Solar System**

Look at as many picture online as possible

Questions like “Which satellite took these pictures?” for popular missions

**Simple machines**

Ratio of two masses

Damped? – research more about it

Resource: Physics classroom website -- Google it

Virtual work

**Crave the wave**

Doppler’s effect – car is coming closer or going away

**Bottle Rocket**

Last time the event was run in 2004 (2009?) and the winning time was 30 seconds

Outdoors launch

Use center of pressure equation – Make Center of Pressure same as center of Mass

Make it wobble in the air

No glue but you can use tape

Poster board was used by a team to increase the surface area and thus increase drag

Coke products work better than Pepsi

For launcher, can be bought from Website – nerdsinc.com approx. cost $129