

**SCIENCE OLYMPIAD - 2007**  
**Balloon Launch Glider – B**  
**Wright Stuff – C**  
**Matthew Chalker and CeAnn Chalker**  
[matthew@chalker.org](mailto:matthew@chalker.org)   [ceann@chalker.org](mailto:ceann@chalker.org)

**BLG and WS – How are they the Same?**

- 2 Ultra light aircraft built and tested prior to competition
- Flown indoors
- Timed for duration aloft
- No Impound
- Aircraft to be labeled with team's identification name & number
- Allowable Materials
  - Wood, paper, plastic film covering, and glue
  - Thread, wire, plastic tubes & rubber bands may be used to attach major components
  - Any dense material for ballast
  - Flight log for 10 previous flights before beginning their test flights at competition

**BLG and WS – How are they Different?**

- Number of flights allowed per team
  - BLG – 3 Glider flights
  - WS – 2 Rubber Band powered Plane flights
- Launching/Power
- Building Specifications
- Other Requirements/Info
- Flight Log Specifications

**Launching/Power - BLG**

- Glider launched from a helium balloon
- Glider has no power, glides to ground

**Building Specifications - BLG**

- Total mass of plane must be at least 2.0 grams
- 40.0 cm max horizontal projected wing span
- 10.0 max wing chord
- 28.0 max horizontal projected stabilizer span

**Launching/Power - WS**

- Plane launched from hand
- Plane powered by wound rubber band
- Uses a propeller

**Building Specifications - WS**

- Total mass of plane must be at least 7.0 grams (without rubber motor)
- Must be a monoplane
- 50.0 cm max horizontal projected wing span
- 7.0 cm maximum wing chord
- 30.0 cm max horizontal projected stabilizer span
- 4.5 cm max stabilizer chord
- Propeller
  - Single two-bladed commercially made plastic propeller
  - Maximum diameter of 18.5 cm
  - Trimming, shaving, twisting allowed
- Rubber Motor
  - 2.0 grams maximum mass (includes O-rings)

### **Additional Requirements/Info - BLG**

- 8 minutes to launch 3 flights starting when their first official flight begins
- Event Supervisor will provide at least one Balloon Launching Rig capable of lifting a 10 gram glider to the ceiling
- Competitors may bring their own Balloon Launching Rigs

### **Flight Log - BLG**

- Flight log with minimum of 4 parameters and for at least 10 flights
  - Height of balloon at glider launch
  - Glider mass at launch
  - Flight time
  - Any other parameter (same for all flights)

### **Bonus – WS**

- State – 10% of the flight time will be added if the plane is a Pusher Plane (Prop behind the wing)
- Nationals – 10% of the flight time will be added if the plane is a Canard Design (Stab is in front of the wing and prop is behind the wing)

### **Competition – BLG & WS**

- Competitors only allowed in testing/flight area
- Test flights allowed throughout competition ending at least by the last 30 mins. of the tournament
- Test flights will yield to official flights
- Multiple aircraft may test fly at once

### **Scoring – BLG & WS**

- Winner is team with longest flight time for any single flight.
- Ties broken by second longest flight time.

### **Deductions & Violations – BLG & WS**

- Flight Log discrepancies
  - Incomplete flight logs will have 10% of the flight time deducted from each flight
  - No flight log will have 30% of the flight time deducted from each flight
- Rule Violations without a specific penalty will be ranked after all teams that do not violate the rules

### **Resources & Supplies**

- Resources
  - indoornews.com
  - indoorduration.com
  - Yahoo Groups –
    - Wright Stuff & Balloon Launch Glider
  - SO website
- Supplies on line
  - F1D.biz
  - FAImodelsupply.com

### **Additional Requirements/Info -WS**

- 8 minutes to launch their 2<sup>nd</sup> flight after their 1<sup>st</sup> official flight ends
- Motors impounded after check-in, available only for official flights

### **Flight Log - WS**

- 6 parameters for 10 previous flights prior to competition
- 3 required parameters
  - Motor size before windup
  - Winds on the motor at launch
  - Flight time
- Additional parameter examples
  - Turns remaining at landing
  - Estimated peak flight height
  - Estimated flight path diameter
  - Torque at launch

### **Additional Resource**

Matthew Chalker  
matthew@chalker.org

# Wright Stuff / Balloon Launch Glider - Common Terms

**Wing-** Main lifting surface

**Stab/Stabilizer-** Smaller horizontal surface, sometimes called tail, attempts to fly parallel to ground in all directions.

**Rudder-** Vertical stabilizer, sometimes called fin

**Dihedral-** Angled portion of wing, often towards tips, helps stabilize flight

**Leading Edge/Spar-** Front part of the wing, first stick across

**Trailing Edge/Spar-** Back part of wing

**Ribs-** Cross members of wing

**Wing/Stab Chord-** Straight line distance from leading edge to trailing edge, parallel to fuselage

**Wing Posts-** Vertical members which attach wing to fuselage

**Fuselage-** Entire centerpiece of the model, holds everything together

**Motor Stick-** Front part of fuselage which the motor attaches to

**Tail Boom-** Back part of fuselage which supports the tail

**Wash-** Vertical difference between leading edge and trailing edge, relative to zero

**Trimming-** The process of getting the model to fly, adjustments and test flight.

**Stall-** Short climbs followed by steep dives

**Mush-** Very light stalling

**Yaw/Roll/Pitch-** The three angles of movement on a plane (or any flying object) to be stabilized

**Yaw-** circular movement of plane level/parallel to the earth, stabilized by the fin/rudder

**Roll-** left or right downward movement of plane, stabilized by wing dihedral.

**Pitch-** forward or rear downward movement of plane, stabilized by the stab.

## Wright Stuff only

**Motor-** Rubber band that powers model, sometimes called rubber

**Prop-** Propeller attached to front of model

**Prop Shaft-** Metal wire that attaches the prop to the motor through the Bearing/Mount

**Prop Pitch-** Angle of the prop blades (low pitch vs. high pitch)

**Thrust Bearing/Prop Bearing/Motor Mount-** Attaches prop to fuselage

**Torque-** The rotational equivalent of force, what the rubber motor imparts upon the propeller

## Places for Wright Stuff / Balloon Launch Glider Info

Matthew Chalker, [chalker.7@osu.edu](mailto:chalker.7@osu.edu)

Wright Stuff Mailing List: [http://groups.yahoo.com/group/wright\\_stuff/](http://groups.yahoo.com/group/wright_stuff/)

Balloon Launch Glider Mailing List: <http://groups.yahoo.com/group/balloonlaunchglider?>

[www.indoorduration.com](http://www.indoorduration.com)

<http://www.soinc.org/events/wrightstuff/>

<http://www.soinc.org/events/balloonlaunchglider/>

# SCIENCE OLYMPIAD

## COACHING 101

CeAnn Chalker

[ceann@chalker.org](mailto:ceann@chalker.org)

### Coaching 101 - Overview

- Science Olympiad in a Nutshell
- Competitions
- State Science Olympiad
- YOUR TEAM...
  - Kids, Coaches, Parents
  - Tournament & Finance Strategies
  - Putting it All Together

### SCIENCE OLYMPIAD 101 (in a Nutshell)

- 23 different events developed at the National Level
  - Cerebral/Study/Lab – 15 events
  - Technical/Building – 8 events
- Team of 15 students
- Divisions
  - “B” – Middle school – 6<sup>th</sup> – 9<sup>th</sup> grades
  - “C” – High school – 9<sup>th</sup> – 12<sup>th</sup> grades

### Competition Format

- 5, 6, or 7 - 50 minute event time blocks
- Scoring
- Individual Event winners recognized
- Top 3-6 teams recognized

### Competitions

- Invitationals [good practice]
  - Hosted by local schools
  - Events run by participating teams
  - Pay a minimal registration fee
- Regional Tournaments
  - Qualifier for State Tournament
- State Tournament
  - Up to 40 teams
  - “Logistics nightmare”
  - 1<sup>st</sup> place team to National (some states 2<sup>nd</sup> place also qualifies)
- National Tournament
  - 54 – 60 teams from across the country

### State Science Olympiad

- State Director
  - Oversees all SO teams in State
  - Conducts State Tournament
  - Registration fee generally paid to State Director
    - Covers both Regional & State tournaments
    - Usually includes Official Event Rules manual
- Regional Tournament
  - Teams assigned to region by State Director
  - Regional Director responsible for tournament
  - Ratio of teams registered progress on to State

### YOUR TEAM.....

- Composition
- Eligibility/Participation Policies
- Event Assignments
- Coaches
- Event Training
- Practices
- Tournament Strategies
- Parental Involvement
- Financial Matters

### Composition

- When to begin
- Generating student interest
- Selection process possibilities
  - Use of a “Try-out”
  - Grade levels
  - Covering all the events
- Student time commitment
- Understanding the “individuality” that equates into a “team”, “one size doesn’t fit all!”

### Eligibility/Participation Policies

- National Science Olympiad Pledge
- School's Extra-curricular eligibility policy
- School participation fee
- Other "activities" restrictions
- Team participation policy/consent
- Medical forms
- Travel permission forms

### Event Assignments

- 23 Events / 15 Team members
- Number of students for an event
- Student preferences
- Cerebral vs. building
- Grade level
- Academic knowledge
- Training for the future

### Coaches

- 1 Coach or 23 Coaches or 23 Coaches all in 1 Coach
- Finding Coaches
- Expectations of Coaches
- Responsibilities
- Liability

### Event Training

- Resources/Study materials
  - Event manual
  - Science Olympiad web site
  - Other
- Permitted event reference materials
- Rule changes
- Rule Clarifications

### Practices - Things to Consider

- Frequency of practices
- Types of practices necessary for event
  - “All events are not created equally”
    - Study Events
      - Group, Lab, e-mail, online (Moodle)
    - Building Events
      - Construction night?
      - Construction Location(s)
      - Liability
- Availability of Coaches and Students

### Tournament Strategies

- Tournament schedule
- “Win/Place/Show” philosophy
- Helping the student
  - Individual schedule
  - Locating event sites
  - Parent pairing
- Event bags

### Parental Involvement

- Coaching
- Organization
- At a tournament
- Hosting an invitational

### Financial Matters

- Supplemental Contract
- Expenses
  - Coaches' training
  - Registration fees / Invitationals
  - Training materials supplies
  - Travel
  - T-shirts
- Fund raising
- Corporate contributions

### Putting It All Together

- Basic Knowledge of all the Events
- Map out the Year
- Find & Use Resources – Human or not
- Realize –
  - Free is good
  - Kids will probably know more than you
  - Micromanagers Burn Out
  - SO is a Way of Life!

# The Reality of Coaching Science Olympiad

CeAnn Chalker [ceann@chalkers.org](mailto:ceann@chalkers.org)

## Question?

How do you coach 15-50 Science Olympiad students if you have limited time, resources, &/or support?

## Realizations

You can't do it all!

You shouldn't be expected to do it all!

You may love SO and SO may be your "life" but you'll burn out real quick if you try to do it all!

## Things to Consider

### 1) How to deal with students

- a. Numbers game – 15 to 50 students
- b. During school vs. before/after school
- c. Student responsibilities – self motivation, self discipline, flexibility, desire to participate (i.e. not parental or peer decision)
- d. Dealing with 15 to 50 different personalities – need to look at each student differently

### 2) Juggling 23 events as a Coach

- a. Numbers game – 1 to 23 coaches
  - i. Coordinating multiple coaches with different commitment levels
- b. Techniques for coaching lots of events and surviving
  - i. Be a resource, most events don't require lecturing or teaching
  - ii. Make sure the kids know the rules...inside & out, backwards & forwards, etc.
  - iii. Know and accept that the kids probably know more than you
  - iv. Set goals or tasks to be accomplished before next meeting
  - v. Expect research to be done on their own
  - vi. Make students accountable for researching, give a specific topic to work on before the next meeting
- c. Decision making
  - i. Set criteria for participation on team
  - ii. Document kids participation during practices & tournaments
- d. Liability issues
  - i. Transportation
  - ii. Outside help
- e. Administrative Support – superior support or just tolerated

### 3) Parents

- a. Greatest resource in some cases
- b. Liability issues
- c. Over supportive parents – interested in own child
- d. Caution to be sure parents are not doing the work

### 4) Resources

- a. Notebooks for each event (3 ring binders)
  - i. Collect masters from kids notes
  - ii. Invitational tests
  - iii. Handouts
- b. Books – label everything as SO property
  - i. Discount Bookstores
  - ii. High School discards
  - iii. University Bookstores
- c. Miscellaneous – Building materials, toys, odds & ends – FREE or CHEAP IS GOOD!
  - i. Begging notices in school newsletter
  - ii. Garage Sales
  - iii. Community businesses
  - iv. Parent contacts
  - v. Always keeping your eye out for SO "Stuff"

### 5) Finances

- a. Funded totally by the school (Wishful thinking)
- b. Totally dependant upon your own fundraisers
  - i. Put less of the burden on the students so they can dedicate time to preparing for events
  - ii. Avoiding having to "sell" items