

Mount Saint Agnes Academy is pleased to invite you to participate in our



STEAM Olympics

Saturday, March 2nd, 2019 @10-2pm

Details

The **STEAM Olympics** is an interactive science competition where teams problem solve and collaborate in 4 40-minute hands-on events. One of the events is a preplanned event.

Any Bermuda schools offering science instruction to students at the primary and middle school level are invited to participate in the Science Olympics. At least one teacher must accompany the students.

TEAMS:

Schools are invited to register 1 or 2 teams of 4 or 5 students in each of the following divisions:

Division 1: year 5 & 6 (born 2008-2010)

Division 2: year 7 & 8 (born 2006-2008)

Separate competitions will be held for each division.

SCHEDULE:

9:30-10:00 am: Check in and registration

10:00-10:15 am: Opening Ceremonies. Introduction of teams and instructions.

10:15-10:55 am: Event 1

11:05-11:45 am: Event 2

11:45-12:20pm: Lunch.

Lunch is provided for team members and teacher chaperones. Prior to March 2nd, the participating schools will be informed of the lunch menu. Students who have dietary concerns with this lunch are requested to bring their own lunch. Students should bring a water bottle which can be filled in the filtered water fountains at the school.

12:20-1:00 pm: Event 3

1:10-1:50 pm: Event 4

2:00 pm: Awards Ceremony

Cost: \$25 per team. Payment can be made by cash or cheque on the day of the competition.

**One of the 4 events is a preplanned event. Information on this preplanned event is included with this invitation.

REGISTRATION

The deadline of registration is **January 31st, 2019**. Should you have any questions contact cwhite@msa.bm

Preplanned Event

Division 1: Year 5 & 6(birth year 2008-2010)

Displacement Dragster

Objective: To construct a vehicle that is powered exclusively by balloons.

Purpose: To explore energy and motion with the goal of obtaining a maximum displacement.

Participants: Teams of 4 or 5.

Materials: The vehicle must be constructed from the following list of materials:

- plastic straws
- plastic beverage containers
- wooden cooking skewers
- wheels [any material - no prefabricated units]
- ROUND balloons
- tape / glue / paint
- paper

There is no requirement to use everything on the list and there is no restriction on the quantity of each item listed. The vehicle must have been built by the team entering it. The reference "no prefabricated units" for the wheels means you cannot use wheels that are manufactured (i.e. wheels from a toy, wheels from rollerblades, wheels from a cart, etc.). You must "build" your own wheel from raw materials (i.e. old CDs, plastic container lids, cut them from a sheet of plywood , etc.)

- Rules:**
1. The vehicle, with the balloons deflated, must be no larger than 35 cm x 35 cm x 20 cm.
 2. Before a run is made the circumference of the balloon will be measured. The circumference can be no larger than 1 meter. You may use only 1 balloon for your vehicle but must have your own back-up balloons in case of accidental explosion
 3. Each vehicle will be allowed 2 runs, with the largest displacement counted. The runs will be made in listed order. This will give each team an appropriate amount of time to make any adjustments and prepare the car for its second run. Missed runs will be given a score of zero.
 4. The vehicle must self-start and must not be given any initial impulse or have any external guidance at the start, or during, the race.

5. All the energy used to propel the vehicle must come from the balloon. The balloon cannot be treated with chemicals, heated or cooled in any way.
6. Balloons will not be provided. Each team should come prepared with "backup balloons" in case any damage is incurred during transport, or on the vehicle's first run.
7. Vehicles will start with their foremost structure on the indicated start line with the displacement being measured from the start line to the closest portion of the vehicle after the run is complete.
8. The race will be over once a vehicle stops completely; however should a vehicle fail to self-start, the run will be given a score of zero.
9. Vehicles judged unsafe or hazardous will be disqualified.

Scoring:

1. Points will be given according to a comparison of the maximum and minimum displacements obtained on the race day.
2. To check that all vehicles meet the size criteria they will be placed into a container that has the inside dimensions of 35 cm x 35 cm x 20 cm. If the vehicle does not fit it will be disqualified.



Preplanned Event

Division 2: Year 7 & 8 (birth year 2006-2008)

A Mousetrap Car

Objective: Teams must build one mousetrap vehicle prior to the Science Olympics. The mousetrap car will push a light plastic cup (8-10 ounces) from the marked starting position 5 linear meters over a smooth, level gymnasium floor (or non-carpeted hallway) and return to the starting line in the least amount of time.

Participants: Teams of 4 or 5.

Requirements:

1. The vehicle must be powered by a single Victor brand mouse trap, nothing more.
2. The mouse trap cannot be physically altered except for the following:
 - holes can be drilled only to mount the mouse trap to a frame
 - the mouse trap's snapper arm may be cut and lengthened
3. The mouse trap's spring cannot be wound more than its normal travel distance or 180 degrees.
4. Vehicles must be self-starting. The vehicle may not start with additional potential and/or kinetic energy other than what can be stored in the mouse trap's spring.
5. The vehicle must steer itself and may not receive a push in any direction once released.
6. The whole car must move along with the cup towards the cup's final resting place. Cups may not be launched, thrown, or pushed out to the target distance.
7. The event supervisor has the final decision as to the appropriateness of any additional items that might be used in the construction of the vehicle.
8. Devices may be constructed *only* by members of the team. Mentors (parents, coaches, teachers, hobbyists, etc.) are absolutely prohibited from constructing any part of the device presented for judging, though they are expected to train and oversee team members in the safe and proper usage of tools. Therefore, team members are required to design their device so that they can build it safely by themselves.
9. **Teams are encouraged to design and construct their own customized devices. Teams are not permitted to construct their devices from purchased complete kits.**

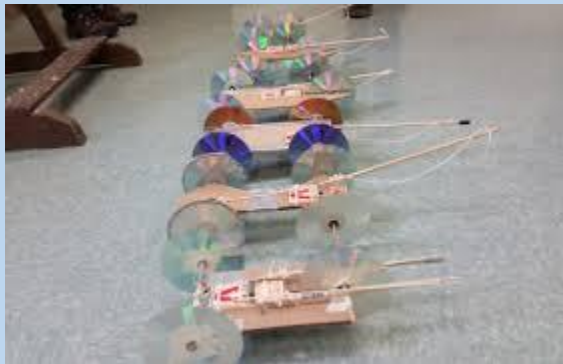
Materials:

1. One mouse trap measuring: $1\frac{3}{4}$ inches \times $3\frac{7}{8}$ inches
2. Any materials such as string, fishing line, bucket lids, sticks, cds, tape, wood.

Scoring:

1. The timing of the vehicle will begin when any part of the vehicle passes over the start line and will end when the vehicle comes to rest.
2. The distance from the target will be measured from the point on the cup that is closest to the starting line.
3. The distance from the start line will be measured from the point of the vehicle that first passed the start line on its way to the target.
4. The winner will be the vehicle that has obtained the lowest score of three attempts. Any ties will be decided by a single run off between the tied vehicles.

$$\text{Score} = (\text{time, in seconds}) + (\text{target distance, in cm}) + (\text{distance from start line, in cm})$$



New this year!
Process Art – Putting the Art in STEAM
Divisions 1 & 2

Each team in Division 1 and 2 must create a visual representation of their pre-build process.

This visual representation should take the place of a tri-fold poster board and should include the following:

1. Plans, Sketches, and/or blueprints of early ideas developed by your team
2. Photographs of your team through the process – building, testing, collaborating together
3. Written captions giving any relevant information
4. Pictures of your device through the development phases – being sure to include early building and then your final device
5. A list of sources used for research

Include on your display the following questions with answers:

- What was the most challenging part of this design task?
- What are you the most proud of?
- What results are you expecting from your device?

The tri-fold should be colourful, engaging and visually appealing. Please have someone check over your written components as spelling and grammar will also be assessed.

More details about how this component will be assessed are included in the rubric on the following page.

Rubric for Visual Display – Process Art (Science Olympics Pre-planned Event)

Task Description: Process Art – Putting the Arts in STEM					
Each team will create a visual representation of their pre-build process following a specific of guidelines and requirements as outlined in the MSA Science Olympics 2019 Information packet.					
Assessment Criteria		4 - Exceptional	3 - Admirable	2 - Marginal	1 - Unacceptable
Visual Appeal		<input type="checkbox"/> Outstanding use of color, design, and space <input type="checkbox"/> Overall design is pleasing and harmonious	<input type="checkbox"/> Adequate use of color, design, and space <input type="checkbox"/> Overall design is mostly pleasing and harmonious	<input type="checkbox"/> Inappropriate use of color, design, and space <input type="checkbox"/> Lack of harmonious design in presentation	<input type="checkbox"/> Little attempt to use color, design and space appropriately <input type="checkbox"/> Project has sloppy appearance
Creativity		<input type="checkbox"/> Original and creative design <input type="checkbox"/> clever and unique in showing the design process	<input type="checkbox"/> Design is adequate <input type="checkbox"/> Clever at times in showing the design process	<input type="checkbox"/> Design lacks creativity <input type="checkbox"/> Few original touches in showing the design process	<input type="checkbox"/> Design is dull <input type="checkbox"/> Little creativity, originality and/or effort showing the design process
Focus and Graphics		<input type="checkbox"/> Information and title clear and easily identified <input type="checkbox"/> All graphics complement purpose of visual	<input type="checkbox"/> Information and title are mostly clear and easily identified <input type="checkbox"/> Most graphics complement purpose of visual	<input type="checkbox"/> Information and title difficult to identify <input type="checkbox"/> Few graphics complement purpose of visual	<input type="checkbox"/> Information and title are not clearly identified <input type="checkbox"/> Graphics do not complement purpose of visual
Written Content		<input type="checkbox"/> All required elements are included <input type="checkbox"/> Accurate and detailed information <input type="checkbox"/> Information adequately supports purpose of visual <input type="checkbox"/> 3 – 4 sources given	<input type="checkbox"/> Most required elements are included <input type="checkbox"/> Accurate information for almost all subject matter <input type="checkbox"/> Information is mostly adequate and supportive of visual's purpose <input type="checkbox"/> 2 – 3 sources given	<input type="checkbox"/> Few required elements are included <input type="checkbox"/> Lacking accurate information <input type="checkbox"/> Inadequate information is not clearly supportive of visual's purpose <input type="checkbox"/> 1 – 2 sources given	<input type="checkbox"/> No required elements are included <input type="checkbox"/> Information is not accurate <input type="checkbox"/> Information does not support the visual's purpose <input type="checkbox"/> No sources given
Mechanics		<input type="checkbox"/> Free of grammatical errors <input type="checkbox"/> No excess glue, torn edges, mark-outs <input type="checkbox"/> Words are legible and pertinent to topic	<input type="checkbox"/> Mostly free of grammatical errors <input type="checkbox"/> Little use of excess glue, torn edges, mark-outs <input type="checkbox"/> Most words are legible and pertinent to topic	<input type="checkbox"/> Frequent grammatical errors <input type="checkbox"/> Excess glue, torn edges, and mark-outs <input type="checkbox"/> Presentation is illegible and confusing	<input type="checkbox"/> Too frequent grammatical errors <input type="checkbox"/> Distractive elements make illustration ineffective

Overall Score: /20

STEAM Olympics Registration Form

Please complete the registration form to register your team(s). Schools can register 1 or 2 teams per division. At least one teacher is required to attend per school.

School Name: _____

Teacher Name: _____

Email address: _____

Phone: _____

Division 1(year 5&6, born 2008-2010) _____ one team _____ two teams

Division 2(year 7&8), born 2006-2008) _____ one team _____ two teams

Signature for Principal or Head of Science to verify students are registered in the correct division and are age appropriate. _____

Please email the completed registration form no later than **January 31st, 2019** to Charlene White cwhite@msa.bm

The registration fee is \$25 per team. Payment can be made in cash or by cheque on the day of the event. (cheque payable to MSA)