The Education Students Society and the Science and Math Education Center are organizing the Nineteenth Annual Science, Math and Technology Fair on the weekend of April 6th and 7th, 2013, at the American University of Beirut. The Fair provides students from schools throughout Lebanon with the opportunity to share scientific, mathematical and technological projects with their peers from other schools.

The Fair aims to encourage and reinforce schools’ efforts in:

• Developing students' scientific and mathematical inquiry and critical thinking skills
• Providing a relevant, hands-on, out-of-class dimension to science and mathematics instruction
• Promoting creativity, initiative, collaborative skills, and independent thinking among students
• Encouraging school / parent / student involvement in the learning process

We are inviting your school to participate in the Nineteenth Annual Science, Math and Technology Fair. We hope that the following questions and answers will provide you with ample information regarding participation in the Fair.

**When and where will the Fair be held?**
The Fair will be held at AUB, in West Hall on Saturday 6th and Sunday 7th of April, 2013.

**Who can participate?**
Kindergarten, elementary, intermediate, and secondary school students from private and public schools throughout Lebanon can participate in the fair.

**How many schools will participate?**
Admission will be on first-come first-serve basis. We will accept the first 24 schools that confirm participation through payment of the participation fee.

**How many projects should a school bring in?**
A school may submit up to 7 projects overall but there should be no more than two projects at any one level: kindergarten, elementary, middle, and secondary – *i.e. a total of 7 projects per school*. It is advisable that schools choose their “best” projects for participation in the Fair. A school may choose to bring either science, mathematics or technology projects OR, to have a combination of all three. In any case, the number of projects per school is limited to a maximum of 7.

**Can students work in groups?**
- Students can work individually or in groups.
- A maximum of four students are allowed to conduct a group project.
- *Each student can participate in only one project.*

**How many supervising teachers can be present with the students?**
*A maximum of three supervising teachers* can accompany students. Other teachers wishing to attend the fair can do so during the visiting hours.
What do we provide?
• A maximum of four tables (approx. 1m by 1m each) per school and two bulletin boards (The walls of the rooms cannot be used).

NO SCHOOL WILL BE ALLOTTED MORE THAN THIS DESIGNATED SPACE SO YOU MUST PLAN WITH THIS SPACE LIMITATION IN MIND!

• Electric outlets. However, we do not provide extension cords.
• General decorations for the exhibit area. (The room not the tables and boards)
• Media coverage

What do you provide?
• Projects
• Materials to decorate your tables and boards (Bring your own materials).
• Extension cords for projects that require electric power for operation.
• Computers, if needed.
• Adult supervisor(s) to accompany your school's project representatives at all time.

►NB: there would be a decoration prize for the best decorated area.

Participation fees
The participation fee for each school is 200,000 LL to be paid in cash (we apologize for not accepting checks or money orders). It is required that your school representative pays the fee and registers your school in person at the SMEC office (Room 241 Fisk Hall, Upper Campus, American University of Beirut, phone number 01-350000 Ext.3097) by January 25th, 2013

How do you participate? What do you need to submit?
Contact us regarding your intent to participate. We will reserve a slot for your school, which will be confirmed only upon payment of the participation fee. Also, you need to submit an entry form for each project that you wish to include in the Fair (Please check and use the attached form).

Can students attend the fair without participating?
If your school does not wish to participate in the Fair by submitting projects, but you would like your students to attend the Fair, please contact us to arrange for your visit. When you contact us please have the description of your vehicle, the name of the driver, and the number of students who plan to visit the Fair. If you bring a school group, be sure that you provide an appropriate number of adult supervisors to accompany your group. Please inform us if you would like to visit our fair before Monday, March 25th, 2013.

Can schools collaborate?
“Joint School Project” category was added to the fair a few years ago. These are projects in any of the given categories that are done by students from two schools joining together. The following are rules and information about this category:
• A maximum total of 4 students from both schools can participate in a joint project.
• This project is not counted as one of the 7 projects allowed for each school. However, there is a maximum of 1 joint project for each school.
• Schools participating with a joint project in addition to other projects do not need to pay an additional fee unless the project is the eighth project submitted by the school. In that case, an additional fee of 22,000 LL will be charged. This charge will be split between the schools involved.
• The students that are involved in these joint projects will not be allowed to be involved in any of the 7 other projects their school is submitting.
• Joint project forms are separate from the other standard school forms, and only one joint school form should be submitted by the two schools working together.
• The same deadline for submission holds for joint projects.

**Deadlines**

• Deadline for registering school participation and paying participation fees is 4:00 p.m. on Friday, January 25th, 2013 (*But remember there will be a maximum of 24 schools participation, so participation will be on a first come first served basis*).
• Deadline for submitting entry forms for participating projects is 4:00 p.m. on Friday, February 22nd, 2013. (See attached form. A separate form needs to be submitted per project.) It is advised to turn in the project entry forms with school registration.
• Schools will received feedback on student projects and final confirmation of participation by Thursday, March 7th, 2013
• Please make sure that you provide us with your vehicle (bus) information (make and plate number), the name of the driver with the participation forms (Deadline: Monday, March 25th, 2013).

**Whom should you contact for further information or for registration?**

• You may contact any of the following members of the Education Students Society (ESS) or SMEC:

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. Joy Jamal Eddine</td>
<td>President of Education Students Society</td>
<td>e-mail: <a href="mailto:jsj02@mail.aub.edu">jsj02@mail.aub.edu</a></td>
</tr>
<tr>
<td>Dr. Tamer Amin</td>
<td>Director of SMEC</td>
<td>01-350000 Extension: 3096/3097 e-mail: <a href="mailto:tamer.amin@aub.edu.lb">tamer.amin@aub.edu.lb</a></td>
</tr>
<tr>
<td>Dr. Rabih EL Mouhayar</td>
<td>Advisor of Education Students Society</td>
<td>01-350000 Extension: 3052 e-mail: <a href="mailto:re29@aub.edu.lb">re29@aub.edu.lb</a></td>
</tr>
<tr>
<td>Dr. Rola Khishef</td>
<td>Co-Advisor of Education Students Society</td>
<td>01-3500 Extension : 3098 e-mail: <a href="mailto:rk19@aub.edu.lb">rk19@aub.edu.lb</a></td>
</tr>
</tbody>
</table>

**HOW WILL THE PROJECTS BE EVALUATED?**

A panel of judges comprising university professors, experienced teachers and advanced AUB students will evaluate the projects. Two judges will independently score each project. Based on these scores, the best projects of each category will receive awards. All students submitting projects will receive participation certificates (Judging criteria are attached).

**What are the criteria for judging the projects?**

General criteria relevant to judging of all projects will include the following points:

1. Relevance: Is the project relevant to the student’s life, the community in which the school is located or more broadly Lebanon? Students are encouraged to avoid projects that are internationally popular but not of immediate relevance. For example, a project dealing with
the diversity of plants in the immediate school environment will be judged more favorably than one dealing with the diversity of plants in different ecosystems in the world.

2. **Creativity:** Does the project reflect a high degree of originality, creativity, or innovation, *both* in the design and execution of the investigation *and* in the way it is presented or displayed?

3. **Sound knowledge and reasoning:** Is the knowledge and reasoning represented in the project accurate, appropriate, meaningful, and reasonable? Are conclusions supported by the evidence presented?

4. **Neatness and clarity of the display** and extent to which Fair guidelines for space and layout were respected.

5. **Clarity and effectiveness of the oral presentation** (included here will be an evaluation of the extent to which the presentation seems to be simply memorized as opposed to based on understanding – judges will ask probing questions to address this)

6. The extent to which the project reflects the student’s own work.

In addition, each project category has its own specific judging criteria which are provided with descriptions of project categories below.

**What kinds of projects are admissible?**

Admissible projects should be the product of student work. **Teacher/parent supervision and assistance, though acceptable, should be kept to a minimum.** Students should be able to demonstrate the skills needed to build the project and are expected to be able to defend their projects and the underlying scientific and mathematical ideas. All projects should be conducted safely and ethically. No animals are allowed on the premises of the fair. No toxic chemicals are also allowed. Any projects involving gas or large amounts of water must be conducted outdoors.

**SCIENCE PROJECT CATEGORIES**

**A. Models and demonstrations:**

Projects entered into this category should focus on helping to explain a specific scientific concept or principle in a new way. In addition to the presentation of the model or demonstration, projects should include a written rationale for why the model or demonstration is a particularly good way to explain the chosen concept or principle. This rationale must at the very least address why the model or demonstration is particularly effective in explaining the chosen concept or principle and why particular materials were chosen.

To clarify this category it is worth considering a “non-example.” A popular model that would not be an appropriate entry would be the popular model of a volcano eruption using vinegar and baking powder. While this model is fun and has some resemblance to an eruption it does not illustrate much about the actual mechanism involved when a real volcano erupts. Models will be judged on their effectiveness in illustrating what scientists understand about some natural phenomenon. Some good examples of models in science would be those illustrating how the heart pumps blood, how muscle contraction actually works, and the factors influencing the distribution of rainfall in Lebanon.

**Specific judging criteria for this category:**

1. **Creativity of the model or demonstration:** Is this a truly innovative way of explaining the chosen topic? Projects that repeat commonly known models and demonstrations will not be evaluated well with respect to this criterion.

2. **The effectiveness of the model or demonstration for explaining the concept or principle:** included here will be an evaluation of the rationale provided by the participant and the judges own evaluation of effectiveness.
B. **Research:**

Student projects entered in this category should provide answers to novel questions raised by the student. Research projects can use either experimental or non-experimental designs. Projects must include a clear statement of the question asked, the method used to address the question (including a rationale for why this method is appropriate), presentation and analysis of results and the conclusions drawn.

As an example of an experimental project participants might investigate the effectiveness of a variety of brands of everyday products (e.g. how well different paper towels absorb liquids). Examples of non-experimental projects might be cataloguing the variety of plant species on the school grounds, tabulating and drawing general conclusions about the nutritional content of certain classes of foods, or researching the rationale for the selection and/or design of one of Lebanon’s nature reserves.

*Specific judging criteria for this category:*

1. **Methodology:**
   - a. Appropriate formulation of research question: Is the research question formulated precisely enough to be addressed? Is it a question that can be realistically addressed by the student given the resources and time available?
   - b. The methods of data collection are appropriate for the question asked.
   - c. Results are appropriately analyzed and presented in a way that helps address the question.
   - d. Conclusions are consistent with the results obtained.

2. **Creativity:** Intriguing questions that are rarely thought of would be evaluated highly.

**TECHNOLOGY PROJECT CATEGORIES**

A. **Models and demonstrations:**

Projects entered into this category should focus on helping to explain how a particular technological innovation works. In addition to the presentation of the model or demonstration, projects should include a written rationale for why the model or demonstration is a particularly good way to explain how the chosen technology achieves its intended function. This rationale must, at the very least, address why the design of this model or demonstration is particularly effective in explaining how this technology works and why particular materials were chosen.

A couple of examples of models in technology are a model of a sewage treatment facility and a model illustrating the energy conserving design of a modern building in Beirut.

*Specific judging criteria for this category:*

1. **Creativity of the model or demonstration:** Is this a truly innovative way of explaining how the technology works? Is this a technology that is rarely understood and thereby makes a good contribution to public understanding? Projects that repeat commonly known models and demonstrations (either in terms of the design or the technology chosen) will not be evaluated well with respect to this criterion.

2. **The effectiveness of the model or demonstration:** included here will be an evaluation of the rationale provided by the participant and the judge’s own evaluation of effectiveness.
B. **Invention:**

All invention projects must present a creative design that solves a problem or achieves some desirable goal. These could be either computer-based or non-computer based.

* **Computer-based**

An entry into this category needs to be a computer-based invention. Examples in this category include innovative computer-based games or educational activities. Also acceptable within this entry are inventions that apply existing computer technologies such as e-mail, graphics packages, digital cameras, and chat rooms for creative and worthwhile purposes. For example, an entry might include a description of how spreadsheets, e-mail and a chat room might be used to coordinate a joint activity involving classes in different schools.

* **Not computer-based**

Creative non-computer-based inventions of any kind fall into this category. Examples include mechanical toys, a toilet that saves water, and a bendable broom that allows you to sweep in places that are hard to reach.

**Specific judging criteria for this category:**
1. Creativity of the idea: this is the crucial criterion for this category.
2. Utility: The invention should be useful not just a clever idea. A fun toy that would give a child a lot of pleasure counts as “useful.”
3. Professionalism of implementation: The design needs to work. What good is a device based on a clever idea but never works?! The invention must work consistently and be sturdy enough to survive frequent use.

► **MATHEMATICS PROJECT CATEGORIES**

A. **Real World Problem Investigation**

Projects entered in this category should involve students in designing, conducting, and reporting on an extended investigation of a problem situation in a genuine real world setting. Appropriate mathematics investigations usually include some or all of the following elements:

- Posing question(s) of interest
- Making and testing predictions, conjectures, estimates
- Making and recording informal observations
- Planning a systematic way to look for answers
- Investigating multiple solution strategies or multiple solutions
- Collecting data systematically
- Organizing and representing data
- Interpreting and drawing conclusions
- Communicating results to others
- Generating new questions for further investigation

**Examples of projects that have been completed in past Fairs:**

**Survey:** Create a survey question about something you would like to know about students in your school. Decide on an appropriate sampling strategy. Collect, tally, organize, present, and analyze your data. Make at least two comparisons among subgroups. Explain your methods. Present your conclusions.
Estimate Large Numbers: Choose a forested area in the mountains and find more than one way to estimate the number of trees contained in the area. Explain all your estimation methods, what factors affect the outcome, and the advantages and disadvantages of each method. (This could also be done with estimating population in a given area of students’ home villages or cities; or estimating traffic flow at a particular intersection, or estimating the number of manakeesh consumed in a certain village or neighborhood in one day, etc.).

Filling Space: Without actually counting anything, estimate or predict how many oranges (pieces of fruit) it would take to completely fill your classroom. Explain how you determined your estimate. Decide on a method to test the accuracy of your estimate. How would things change if you filled the room with a different object? Why? Explain your methods. Present your conclusions.

Probability Simulation: Choose a real world situation. Design an appropriate simulation model (e.g., winning prizes in cereal boxes, probability of having the same birthday, animal and human habitats, etc.). Carry out your simulation. Explain your methods and why your simulation makes sense. Present your conclusions.

B. Abstract Problem Investigation

Projects entered into this category should involve students in selecting an open-ended, non-routine, abstract mathematical problem that can be solved in more than one way or has multiple solutions, and designing at least one way to solve it. Typically such problems should go above and beyond what is covered in the normal school curriculum. Projects that include exploration of multiple solution strategies would be judged more favorably than those that show only one way of solving (when there are more) or only one solution (when there are more). Projects in this category could also involve pattern exploration. An example of a project of this type completed in past fairs is the following geometry investigation: In the given square WXYZ with midpoint M of the line segment WZ, the lines XZ and YM partition the square into four portions marked p, q, r, and s. Express the areas of p, q, r, and s as fractions of the areas of the square. Hence, find ratios of the areas p:q:r:s. Show at least three different ways of solving the problem. Your different solutions should be m

C. Real World Model or Demonstration

Projects entered into this category should explain a specific mathematical concept or process in a new way and show how the chosen concept or process functions in the real world. The model or demonstration must illustrate the meaning of the chosen concept or why a certain process works and what concepts underlay it and why it is significant in one or more real world situation(s). In addition to the presentation of the model or demonstration, projects should include a written rationale for why the model or demonstration is a particularly effective way to explain the chosen concept or process and how it functions in the real world. It would not be appropriate simply to make a three-dimensional model that shows, for example, a geometric theorem or illustration of place-values or geometric shapes, etc.
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<tr>
<th>Date</th>
<th>Time</th>
<th>Activities</th>
<th>Notes</th>
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<tbody>
<tr>
<td><strong>Friday, January 25th, 2013</strong></td>
<td>4:00 p.m.</td>
<td>• Deadline for confirming participation by payment of participation fees at SMEC office (Room 241, Fisk Hall, AUB)</td>
<td>• Only cash payments are accepted (checks are not accepted)</td>
</tr>
<tr>
<td><strong>Friday, February 22nd, 2013</strong></td>
<td>4:00 p.m.</td>
<td>• Deadline for submitting entry forms for participating projects</td>
<td>• Please fill one entry form per project</td>
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<td><strong>Thursday, March 7th, 2013</strong></td>
<td>4:00 p.m.</td>
<td>• This is our deadline for providing feedback to schools regarding projects.</td>
<td>• This is our chance to confirm participation of specific projects in light of our review of whether the proposals meet the guidelines of the Fair especially safety concerns.</td>
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<td>10:00 a.m. to 1:00 p.m.</td>
<td>• Schools/students bring in and set-up projects</td>
<td>• No extra space will be provided. Projects' size should fit with the provided space</td>
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<td>2:00 p.m.</td>
<td>• Opening ceremony at Assembly Hall</td>
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<td><strong>Saturday, April 6th, 2013</strong></td>
<td>3:00 p.m. to 7:00 p.m.</td>
<td>• Judging will take place. Students should be with their projects at three sharp so that judges can evaluate their work.</td>
<td>• Parents, teachers, principles, directors, friends, media etc… are not allowed inside during the judging of the projects. Only the designated supervisors and students are allowed inside the fair during judging. This will be strictly enforced.</td>
</tr>
<tr>
<td><strong>Sunday, April 7th, 2013</strong></td>
<td>11:00 a.m. to 2:00 p.m.</td>
<td>• Fair is open to the public (visiting schools, students, parents, the media, etc.)</td>
<td>• Projects should not be removed before the closing ceremony.</td>
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<td>• Results will only be</td>
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<td>Time</td>
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| 2:30 pm to 3:30 pm | • Closing ceremony at Assembly Hall  
                    • Announcing winning projects  
                    • Distribution of certificates, prizes, and awards | released during the ceremony and not before.               |
| 4:00 p.m. to 6:00 p.m. | • Schools/students dismantle and remove projects | • All projects should be removed by 6:00 p.m. sharp from the exhibit area |
- Each school should submit one completed coversheet as well as a completed entry form for each project (entry forms will need to be photocopied).

- Please print neatly and in English

**COVERSHEET (One per school)**

School name: ________________________________

Supervising teacher (s): ________________________________

School Mailing Address: ________________________________

School Phone Number: ________________________________

School E-mail Address: ________________________________

Supervising Teacher's E-Mail: ________________________________

Supervising Teacher's Phone #: ________________________________
Eighteenth Annual Science, Math and Technology Fair
April 28th - 29th, 2012

Code: __________

Entry Forms
*Please make photocopies of this form and complete one per project

Name of School:

Project Title:

Language: _____ French  _____ English

Student Name(s): 1- ________________________________

2- ________________________________

3- ________________________________

4- ________________________________

Level: ____ Kindergarten  ____ Elementary  ____ Intermediate  ____ Secondary

My/our project is a:

Please indicate the entry category to which your project belongs. Give this selection careful thought so that your project is judged according to the appropriate criteria. Choose one of the following categories:

Science Project Categories: (please read the descriptions of categories provided on the other sheet before checking the project’s category)

_______ Models and Demonstrations  _______ Research

Math Project Categories: (please read the descriptions of the categories provided on the other sheet before checking the project’s category)

_______ Real World Problems Investigation  _______ Abstract Problem Investigation

_______ Real World Model and Demonstration
Technology Project Categories: (please read the descriptions of the categories provided on the other sheet before checking the project’s category)

_______ Model and Demonstrations  _______ Invention

Provide a brief description of the project (do not exceed 100 words)
If this section is not completed the project will be rejected
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Please indicate whether your project involves computer usage.

_______ Yes  _______ No

Please indicate whether your project needs electrical power.

_______ Yes  _______ No

Please indicate whether your project involves gas.

_______ Yes  _______ No

Please indicate whether your project involves water.

_______ Yes  _______ No

If yes, please explain briefly ........................................................................................................
................................................................................................................................................
................................................................................................................................................

Deadline for submitting completed forms: Monday, March 12th 2012
Submit all forms to:

Education Student Society,
Dept. of Education, Room 105, Fisk Hall, AUB
P.O. Box: 11 - 0236, Beirut, Lebanon
Or bring to SMEC office, 2nd floor, Room 241, Fisk Hall, AUB

Information is also available on the SMEC Website
http://www.aub.edu.lb/fas/smeq/Pages/index.aspx
Eighteenth Annual Science, Math and Technology Fair
April 28th - 29th, 2012

Code: __________

Entry Forms for Joint School Projects

Project Title:
___________________________________________________________________________

Names of collaborating schools:
___________________________________________________________________________

Language: _____French     _____English

Student Name(s) (specify school in each case)

1-________________________________________________________

2-________________________________________________________

3-________________________________________________________

4-________________________________________________________

Level: _____ Kindergarten     _____Elementary     _____Intermediate     _____Secondary

My/our project is a:

Please indicate the entry category to which your project belongs. Give this selection careful thought so that your project is judged according to the appropriate criteria. Choose one of the following categories:

Science Project Categories: (please read the descriptions of categories provided on the other sheet before checking the project’s category)

_______ Models and Demonstrations     _______ Research

Math Project Categories: (please read the descriptions of the categories provided on the other sheet before checking the project’s category)
Real World Problems Investigation

Abstract Problem Investigation

Real World Model and Demonstration

**Technology Project Categories:** (please read the descriptions of the categories provided on the other sheet before checking the project’s category)

Model and Demonstrations

Invention

Provide a brief description of the project (do not exceed 100 words)

*If this section is not completed the project will be rejected*

... ...

... ...

... ...

... ...

... ...

Please indicate whether you want your project to be placed indoor or outdoor.

Indoor

Outdoor

Please indicate whether your project involves computer usage.

Yes

No

Please indicate whether your project needs electrical power.

Yes

No

Please indicate whether your project involves gas.

Yes

No

Please indicate whether your project involves water.

Yes

No

If yes, please explain briefly and tell us the quantity of water needed:

Deadline for submitting completed forms: Monday, March 12th, 2012

Submit all forms to:

Education Student Society,
Dept. of Education, Room 105, Fisk Hall, AUB
P.O. Box: 11 – 0236, Beirut, Lebanon

Or bring to SMEC office, 2nd floor, Room 241, Fisk Hall, AUB
General information about the projects and the organization of the Fair

I - Concerning the Projects:

- Projects should be the student(s)' own work.
- The size of the projects should fit with the space each school will have (no extra space is offered no matter what).
- Projects with fire and/or animal abuse are not allowed.
- Projects cannot be changed or replaced after the deadline mentioned on the participation forms.
- The category of the project should be specified clearly in the entry forms because the projects in different categories are evaluated using different criteria. The committee preserves the right to change the category of a project if it is entered into an inappropriate category.

II - Concerning the Students:

- Each student can participate in only one project.
- Membership in group projects is limited to a maximum of four students.

III - Concerning the Teachers:

- Only 3 supervising teachers are allowed at the fair to accompany their students. All other teachers, principals, coordinators etc. can visit the fair during the visiting hours that will be specified in the participation forms.
- Teachers will not be allowed to stand next to their students during the judging.
- Teachers are expected to coordinate with the principal and ask him/her for the participation form. (The forms are generally sent to the principals).

IV - Concerning the Presentation of Project:

- Students are expected to be present next to their projects when the judges come to evaluate them. If the students are not present when the judge arrives the project will be disqualified. The time of the project's presentation should not exceed 10 minutes. This will be strictly enforced.
- In case of group projects, all the students of the group are expected to participate in the presentation and to answer the judge's questions. (see judging form)
- Students are not advised to memorize what they have to say. They are encouraged to present through understanding of their work.

NOTE THAT:

- Only students and supervising teachers are allowed in the West Hall (Common Room & Auditorium A) during judging time.
- If any student is caught interfering with projects from another school, his/her entire school will be disqualified.