

2010 Massachusetts State High School Science & Engineering Fair Student Checklist (1A) – TEAM

Every student must fill out this entire form before beginning project experimentation.

READ INSTRUCTIONS ON PAGE 2 BEFORE COMPLETING FORMS 1A, RESEARCH PLAN, 1B, AND 1

Contact the MSSEF Scientific Review Committee (SRC) by e-mail at src@scifair.com

Project year includes research conducted over a maximum, continuous 12-month period between January 2009 and April 2010.

PLEASE PRINT OR TYPE

Student Name (1) _____ (2) _____ (3) _____

Grade, Gender Grade: _____ Gender: M F Grade: _____ Gender: M F Grade: _____ Gender: M F

Home Address, Apt # _____

City, State, Zip Code _____

Home Telephone _____

Email Address _____

School _____ School Telephone _____

School Address _____ City _____ State _____ Zip Code _____

Teacher/Adult Sponsor Name _____ Phone _____ Email _____

Project Title _____

1. Is this a continuation from a previous year? (Check one) YES NO Grades entered in MSSEF: 6 7 8 9 10 11

If Yes:

a) Attach previous year(s) Abstract Form 1A and Research Plan

b) Explain how this project is new and different from previous years on Continuation Form (7)

2. **This year's** laboratory experiment/data collection will begin: (must be stated mm/dd/yy)

Projected Start Date: _____ Projected End Date: _____

ACTUAL Start Date: _____ ACTUAL End Date: _____

3. Where will you conduct your experimentation? (Check all that apply)

Research Institution School Field Home Other _____

4. List name, address, and phone number of all non-school work site(s):

Name: _____

Address: _____

Phone: _____

5. Complete a Research Plan and attach to this form.

REFER TO CONSENT FORM CHECKLIST ON THE WEBSITE (www.scifair.com) FOR ADDITIONAL FORMS FOR RESTRICTED AREAS BELOW.

The following areas of study require approval from either the MSSEF or a Regional Scientific Review Committee (SRC) before experimentation begins. Refer to the MSSEF Manual for their definition. A qualified scientist and/or designated supervisor must be named and appropriate forms filled out (Forms 2/3). Check all items to be used in your research.

**Hazardous Chemicals, Activities or Devices
Form 1, 3 [1C, 2, if required]**

- _____ Carcinogenic or Mutagenic Chemicals
- _____ Nuclear Radiation or Radioactive Substances
- _____ Highly Toxic or Explosive Chemicals (check MSDS)
- _____ High Voltage Equipment
- _____ Ionizing Radiation
- _____ Welding Equipment
- _____ Lasers (Class II-IV)
- _____ Firearms
- _____ Controlled Substances (DEA chemicals, prescription drugs, alcohol, tobacco, etc.)

**Research Performed in an Industrial/Institutional Setting
Form 1, 1C, 2 or 3 [6A, 6B, if required]**

The following areas of study require approval from either the MSSEF or a Regional Scientific Review Committee (SRC) before experimentation begins, and also require that you attach the appropriate Consent Forms to the Student Checklist (1A) & Research Plan. Check all items to be used in the research.

_____ **Potentially Hazardous Biological Agents**

Form 1, 2, 6A [1C, 3, 6B if required]

_____ **Vertebrate Animals**

Form 1, 2, 5A or 5B [1C, 3, if required]

_____ **Human/Animal Tissue**

Form 1, 2, 6B [1C, 3, 6A if required]

_____ **Human Subjects** (including surveys & studies)

An Institutional Review Board (IRB) should review all protocols before forms are sent to the SRC.

Form 1, 2, 4 [1C, 3, if required]

All bacteria, fungi, etc. isolated from the environment should be considered potentially hazardous biological agents.

Submit a copy of completed form(s) to the SRC Committee for approval before experimentation begins.

I have read the material in these boxes **AND**: our research does **NOT** involve any of the above.
 our research involves one or more of the above.

Signatures: _____ Date: _____
Team Leader Team Member #2 Team Member #3

INSTRUCTIONS

All 2010 Massachusetts State Science & Engineering Fair (MSSEF) participants, their parents, teachers and research supervisors must take appropriate steps to thoroughly understand the procedures, and in some cases, the risks involved in the research that students would undertake when working on science projects. Therefore, all MSSEF participants are required to complete the Student Checklist - Form 1A, Form 1B, Form 1, and the Research Plan. All sections must be filled out before project work begins. These forms and additional forms, where required, fulfill MSSEF and International Science & Engineering Fair (ISEF) requirements.

Student Checklist (1A) & Form 1B – Required Approvals

The student identifying information and Teacher, Student, and Parent/Guardian approvals should be filled out as soon as student and teacher/supervisor have completed the Research Plan and before work on project begins. **Each student in a team must complete a Form 1B.** Signatures indicate that the students have read, understood and agreed to the MSSEF Ethics Statement (see the manual or www.scifair.com).

Research Plan

The Research Plan must be completed before the student begins project work. Fill out date information accurately. The Plan must cover the points listed below. If project involves the use of any items listed in boxes on Form 1A, the student must obtain Scientific Review Committee (SRC) approval before **any** research is started.

A. Question or Problem being addressed

The students should present the ideas behind the research. Why is the research to be done? There should be a reason for wanting to do the research. Some explanation should be given regarding what the research is expected to show and what is to be learned. The last statements of this section should include a specific purpose of the research. The purpose should reflect a very close relationship with the title. Use additional sheets if needed.

B. Hypothesis/Engineering Goals

A specific statement of the Hypothesis(es) or Engineering Goals must be included.

C. Methods or Procedures

Methods to be used in the research, including chemical concentrations and drug dosages, should be presented in detail. For example, if an animal or embryo is to be treated with drugs, include the name of the drug, the concentration and amount of the drug to be administered; the method of administration should be clearly outlined. It should be very clear that the student knows exactly what he or she is to do prior to the initiation of the research. If blood is to be drawn, the methods for obtaining the blood samples and the types of analyses to be carried out should be given. If tissues samples are to be taken, the methods of obtaining the tissue should be outlined. It should be clear what the student is looking for in the tissue and how the tissue samples are to be processed.

For projects involving human research, include survey or questionnaire if used, and critically evaluate the risks. For vertebrate animal research, you must briefly discuss potential alternatives and present reasons why alternatives are not suitable. (See Manual for Rules)

When the project involves potentially dangerous chemicals, including radionuclides, instruments or techniques, specific reference should be made in this section to safety requirements observed.

When the use of electrical current laser beams, sound stimuli, or other artificial stimuli or stresses are to be integral parts of the procedure, they will not exceed the normal tissue tolerance for the species concerned and should be specifically indicated in the plan.

MAJOR DEVIATIONS FROM THE APPROVED PLAN MAY ONLY BE IMPLEMENTED WITH THE WRITTEN APPROVAL OF THE QUALIFIED SCIENTIST OR THE TEACHER-SUPERVISOR AND MUST BE RE-SUBMITTED TO THE SRC FOR APPROVAL.

D. Bibliography

List the books, articles and papers that were read in preparation of the Research Plan. Each reference should contain the author, title of the book or paper, publisher, date of publication, and pages used. Bibliographies comprised completely or predominantly of interview or personal communications are unacceptable. Research involving animals must have appropriate references on animal care. List at least **FIVE** major references (i.e., science journal, articles, books) from your library research.

Checklist for Teacher/Adult Sponsor Form (1)

This Form must be completed prior to experimentation. All students must have a Teacher/Adult Sponsor.

Research Plan

REQUIRED for ALL Projects Before Experimentation

A complete research plan must accompany Checklist for Student (1A)

Provide a typed research plan and attach to Student Checklist (1A).

The research plan for ALL projects is to include the following:

- A. **Question or Problem being addressed**
- B. **Hypothesis/Engineering Goals**
- C. **Description in detail of method or procedures** (The following are important and key items that should be included when formulating ANY AND ALL research plans.)
 - **Procedures:** Detail all procedures and experimental design to be used for data collection
 - **Data Analysis:** Describe the procedures you will use to analyze the data that answer research question or hypothesis
- D. **Bibliography:** List at least five (5) major references (e.g. science journal articles, books, internet sites) from your literature review. If you plan to use vertebrate animals, one of these references must be an animal care reference.
 - Choose one style and use it consistently to reference the literature used in the research plan
 - Guidelines can be found in the Student Handbook

These are guidelines and should be followed where applicable. *Refer to Items 1-4 below.

1. **Human subjects research:**
 - **Subjects.** Describe who will participate in your study (age range, gender, racial/ethnic composition). Identify any vulnerable populations (minors, pregnant women, prisoners, mentally disabled or economically disadvantaged).
 - **Recruitment.** Where will you find your subjects? How will they be invited to participate?
 - **Methods.** What will participants be asked to do? Will you use any surveys, questionnaires or tests? What is the frequency and length of time involved for each subject?
 - **Risks.** What are the risks or potential discomforts (physical, psychological, time involved, social, legal etc) to participants? How will you minimize the risks?
 - **Benefits.** List any benefits to society or each participant?
 - **Protection of Privacy.** Will any identifiable information (e.g., names, telephone numbers, birthdates, email addresses) be collected? Will data be confidential or anonymous? If anonymous, describe how the data will be collected anonymously. If not anonymous, what procedures are in place for safeguarding confidentiality? Where will the data be stored? Who will have access to the data? What will you do with the data at the end of the study?
 - **Informed Consent Process.** Describe how you will inform participants about the purpose of the study, what they will be asked to do, that their participation is voluntary and they have the right to stop at any time.
2. **Vertebrate animal research:**
 - Briefly discuss **POTENTIAL ALTERNATIVES** and present a detailed justification for use of vertebrate animals
 - Explain potential impact or contribution this research may have (see rules)
 - Detail all procedures to be used
 - Include methods used to minimize potential discomfort, distress, pain and injury to the animals during the course of experimentation. Under Massachusetts Law, an animal cannot be put under duress/stress. This greatly limits what can be done in a vertebrate animal project.
 - Detailed chemical concentrations and drug dosages. Very strict rules apply. No animal's normal diet can be interrupted, etc. See rules.
 - Detail animal numbers, species, strain, sex, age, etc.
 - Include justification of the numbers planned for the research
 - Describe housing and oversight of daily care
 - Discuss disposition of the animals at the termination of the study
3. **Potentially Hazardous Biological Agents (see rules):**
 - Describe Biosafety Level Assessment process and resultant BSL determination
 - Give source of agent, source of specific cell line, etc.
 - Detail safety precautions
 - Discuss methods of disposal
4. **Hazardous Chemicals, Activities & Devices:**
 - Describe Risk Assessment process and results
 - Detail chemical concentrations and drug dosages
 - Describe safety precautions and procedures to minimize risk
 - Discuss methods of disposal