



# Singapore Science and Engineering Fair (SSEF) 2020

## Teacher Coordinators' Briefing

04 Jul 2019 (Thu)

Science Centre Singapore

Jointly organised by:



Ministry of Education  
SINGAPORE

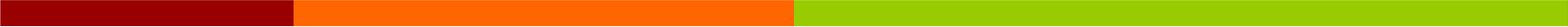


Agency for  
Science, Technology  
and Research



---

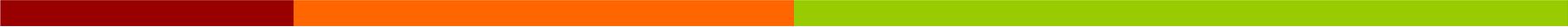
The Singapore Science and Engineering Fair



# Agenda

- Introduction to SSEF / ISEF
- Registration for SSEF 2020
  - Registration Processes
  - Completion of Forms & Common Issues
  - Updates from Intel ISEF 2019
  - Matters Relating to H3 Science Research
- Networking and Sharing of Practices





# Introduction to SSEF / ISEF

# Singapore Science and Engineering Fair (SSEF) 2020

- Organised by MOE, A\*STAR and Science Centre Singapore
- SSEF 2020 is the 20<sup>th</sup> Anniversary
- Some numbers for SSEF 2019:
  - **553** projects submitted
  - **609** participants at the Fair
  - **396** judges at the Fair
  - **154** Gold / Silver / Bronze / Merit / Special\* awards



# Singapore Science and Engineering Fair (SSEF) 2020

- **Main Category** is open to all students studying in MOE schools, who are between 15 - 20 years old as of **01 May 2020**
- Eligibility:
  - Each student can only submit **one** project
  - Include no more than 12 months of continuous research and may not include research performed before Jan 2019
  - Individual or Team (no more than 3 members) projects
- Key dates\*:
  - 04 Mar 2020 (Wed) – Final Judging Day
  - 05 Mar 2020 (Thu) – Public Day

\*to be confirmed when School Terms and Holidays for 2020 released in Aug 2019



# Project Categories

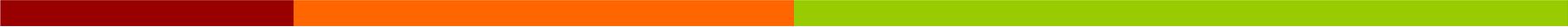
Animal Sciences	Earth and Environmental Sciences	Mathematics
Biochemistry	Embedded Systems	Microbiology
Biomedical and Health Sciences	Energy: Chemical	Physics and Astronomy
Biomedical Engineering	Energy: Physical	Plant Sciences
Cellular and Molecular Biology	Engineering Mechanics	Robotics and Intelligent Machines
Chemistry	Environmental Engineering	System Software
Computational Biology and Bioinformatics	Materials Science	Translational Medical Sciences

\*For more info on the categories and subcategories, refer to:

<https://student.societyforscience.org/intel-isef-categories-and-subcategories>

**NOTE: Behavioural and Social Sciences is NOT offered at SSEF.**





# Singapore Science and Engineering Fair (SSEF) 2020

- SSEF is affiliated to International Science and Engineering Fair (ISEF)
- Top SSEF projects (main category) will be selected to represent Singapore at **ISEF 2020**
  - **Anaheim, California, USA**
  - **10 – 15 May 2020**
- Singapore Citizens or PRs
- Official Website: <https://student.societyforscience.org/intel-isef>



# Singapore Science and Engineering Fair (SSEF) 2020

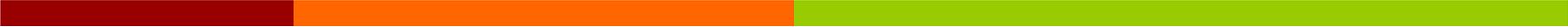
- SSEF winners will also be shortlisted to take part in A\*STAR Talent Search
  - to recognise students who have excelled in Scientific Research
  - website: <http://www.science.edu.sg/ats>
- SSEF winners may also be selected to take part in regional Science Fairs:
  - Taiwan International Science Fair (TISF)
  - ASEAN Science Project Conference (ASPC)
  - and others



# Singapore Science and Engineering Fair (SSEF) 2020

- Junior Scientists Category is open to **Sec 1 and Sec 2 students (in 2019)** studying in MOE schools
- **Preferably** having at least 1 member below age 15 as of **01 May 2020**
- Projects in Sciences / Math / Computing / Engineering
- Eligibility:
  - Each student can only submit **one** project
  - Include no more than 12 months of continuous research and may not include research performed before Jan 2019
  - Individual or Team (no more than 3 members) projects



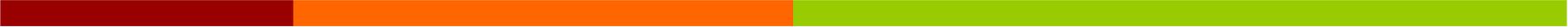


# Registration for SSEF 2020

# SSEF / ISEF Rules and Regulations

- <https://student.societyforscience.org/international-rules-pre-college-science-research>
- Scientific fraud and misconduct are not condoned at any level of research or competition.
- Plagiarism, forgery, using other researchers' work as one's own and fabrication of data will result in immediate disqualification.
- **Projects that do not comply with safety & ethical guidelines will be disqualified.**





**Online  
registration of  
projects**

**1 Nov - 1 Dec  
2019**



## Step 1: Online Registration of Projects

- To register, your students must log-on to **Forms.sg**:
  - SSEF - <https://go.gov.sg/ssef2020>
  - Junior Scientist - <https://go.gov.sg/ssef2020js>
- The completed form must be submitted between **01 Nov – 01 Dec 2019** (both dates inclusive).  
Late submissions will **NOT** be accepted.
- A confirmation email will be sent upon successful registration to both team leader and teacher i/c.
- On 16 Dec 2019, schools will be provided with the allocated **project codes** and the **log-in details** for online submission of project report.



**Online  
registration of  
projects**

**1 Nov - 1 Dec  
2019**



**Submit  
project by**

**08 Jan 2020**



## Step 2: Submission of Project

➔ Main category projects need to submit the following items:

### 1. **Cover Page, Abstract, Project Report, Research Plan**

- Students to upload softcopy via online portal (using login details provided)
- The online portal would be 'live' between 1 Jan and 8 Jan 2020
- Deadline: **08 Jan 2020, 2359 h** (Wednesday)
- Project Code and Project Title to be indicated on ALL submissions.
- Participants' names and affiliations (e.g. school) are NOT to be included.

### 2. **SSEF & ISEF Registration Forms**

- School coordinators to submit password-protected softcopy to Science Centre via google drive by **09 Jan 2020, 1700 h**



## Step 2: Submission of Project

- Details of submission requirements and forms can be found at: <https://www.science.edu.sg/for-schools/competitions/singapore-science-and-engineering-fair>
- Late submissions will not be accepted



## Step 2: Submission of Project

➤ Junior Scientist category projects need to submit the following items:

1. **Cover Page, Abstract, Project Report, Research Plan**

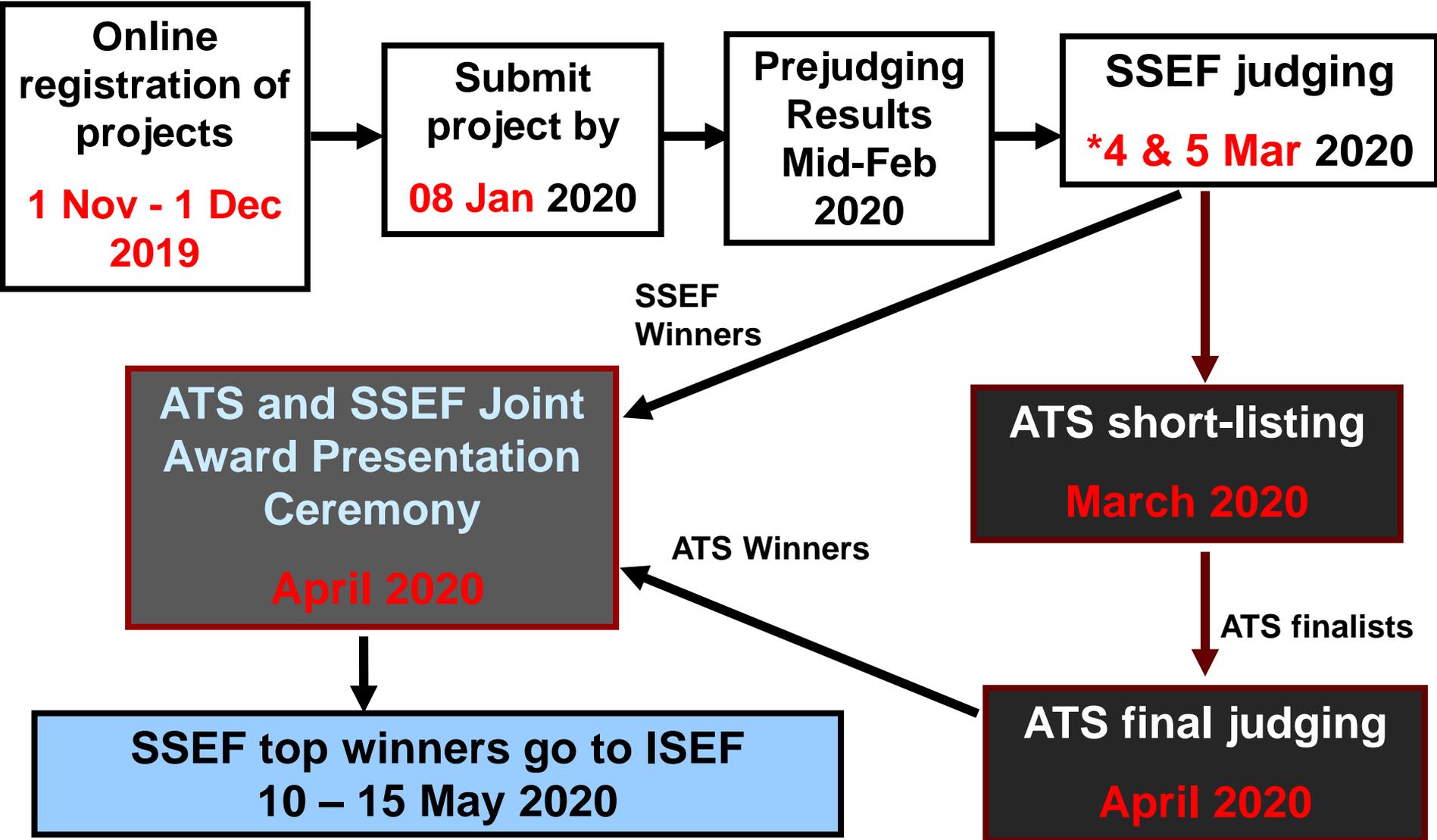
- (as per SSEF projects)

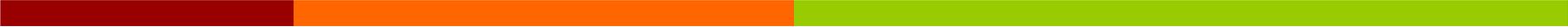
2. **SSEF Registration Forms**

- Only one registration form (i.e. SSEF)
- School coordinators to submit password-protected softcopy to Science Centre via google drive by **09 Jan 2020, 1700 h**

3. **Video Awards**

- A short video clip (max 2 min, summarising the research project)
- To be uploaded to a selected platform by **31 Jan 2020, 2359 h**
- More details would be put up on SSEF website.





# Completion of Forms and Common Issues



# SSEF / ISEF Rules and Regulations

➤ Expanded Ethics Statement

(**to include adults involved** *NEW!*)

➤ addresses integrity, legality, respect for confidentiality and intellectual property, and stewardship of the environment



integrity



legality



confidentiality



intellectual  
property



environment

# SSEF / ISEF Forms

- SSEF/Intel ISEF forms serve to:
  - ensure safe laboratory practices and adherence to regulations
  - protect the rights and welfare of the
    - student researcher(s)
    - human participant(s)
    - vertebrate animal subject(s)
  - protect the environment
- It is **NOT** an additional administrative burden but a necessary part of scientific research.



# SSEF / ISEF Forms

➤ **Every project submission** must include:

➤ Form 1 (Checklist for Adult Sponsor)

➤ Form 1A (Student Checklist) + Research Plan / Project Summary

- In the research plan, state very clearly which steps are carried out by students and which are carried out by qualified adults.
- If there are deviations to the original research plan, those changes must have been approved and be recorded in the project summary.

➤ Form 1B (Approval Form) – 1 per **member**

➤ Form 3 (Risk Assessment)\*\*

- Compulsory except for work that are purely computational



# SSEF / ISEF Forms

➤ **Additional forms** if applicable:

- Form 1C: If work conducted in regulated research institutions (RRIs)
  - **BSL2 projects must NOT be conducted in school labs**
- Form 7: If the project is a continuation / progression of a previous project in the same field of study
  - + previous abstract
  - + previous research plan



## SSEF / ISEF Forms

- **Additional forms** required if project involve:
  - Human Participants
  - Vertebrate Animals
  - Potentially Hazardous Biological Agents
  
- Approval from school or RRI's IRB / SRC **before experimentation** required  
(Form 1B and other relevant forms)

# IRB / SRC

## ➤ Institutional Review Board (IRB)

- Role: To evaluate potential physical and / or psychological risk of research involving humans. Includes reviewing of surveys / questionnaires to be used in project.
- Composition: min 3 members
  - 1 × Educator
  - 1 × Principal / Vice principal (or equivalent administrator)
  - **1 × Medical or mental health professional**

# IRB / SRC

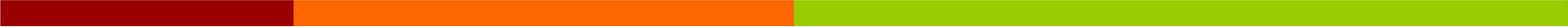
## ➤ Scientific Review Committee (SRC)

- Role: To evaluate student research for compliance with rules, laws and regulations
- Composition: min 3 members
  - **1 × Biomedical scientist with a doctoral degree**
  - 1 × Educator
  - 1 × Additional member

## Setting up school's IRB / SRC

- For schools that are interested to set up their own IRB/SRC, please seek Affiliated Fair approval by sending the necessary documents and forms to:  
**Science Centre Singapore**  
**SSEF Secretariat**  
**15 Science Centre Road**  
**Singapore 609081**
- No Adult Sponsor, parent or other relative of the student(s), the Qualified Scientist, or the Designated Supervisor who oversees the project may serve on the IRB / SRC reviewing that project.





## SSEF / ISEF Forms

➤ **Additional forms** required if project involve:

➤ **Human Participants**

- IRB approval required (Form 1B, Form 4)
- Qualified Scientist Form 2 (if applicable)
- Human Informed Consent form (if applicable)
- Sample Survey form (if applicable)

# SSEF / ISEF Forms

➤ **Additional forms** required if project involve:

➤ **Vertebrate Animals**

- SRC approval required (Form 1B)
- Qualified Scientist Form 2
- Vertebrate Animal Form 5A (if done at non-regulated RI) /  
Vertebrate Animal Form 5B (if done at regulated RI)
- PHBAs Risk Assessment Form 6A (if applicable)
- Human & Vertebrate Animal Tissue Form 6B  
(if applicable)
- IACUC Approval (if applicable)

# SSEF / ISEF Forms

➔ **Additional forms** required if project involve:

➔ **Potentially Hazardous Biological Agents**

- SRC approval required (Form 1B)
- Qualified Scientist Form 2 (if applicable)
- PHBAs Risk Assessment Form 6A
- Human and Vertebrate Animal Tissue Form 6B (if tissue is involved)

# SSEF / ISEF Forms

Type of project	Documents to submit
<b><u>ALL</u></b> projects	Form 1 Form 1A + Research Plan/Project Summary Form 1B – 1 per <b>member</b> <b>Form 3** - Compulsory except for purely computational work)</b>
Work conducted in regulated RIs	+ Form 1C
Continuation of project	+ Form 7 (and previous years' abstracts and research plans)
Involved human participants	+ Form 1B, Form 4 + Form 2 (if applicable) + Human Informed Consent form (if applicable) + Sample Survey form (if applicable)



# SSEF / ISEF Forms

Type of project	Documents to submit
Involve vertebrate animals	+ Form 1B + Form 2 + Form 5A (if done at non-regulated RI) / Form 5B (if done at regulated RI) + Form 6A (if applicable) + Form 6B (if applicable) + IACUC Approval (if applicable)
Involve potentially hazardous biological agents	+ Form 1B + Form 2 (if applicable) + Form 6A + Form 6B (if tissue is involved)



## SSEF / ISEF Forms

- ➔ Form wizard: generate a list of forms required for your project  
<https://ruleswizard.societyforscience.org>



- ➔ Download Intel ISEF forms from  
<https://student.societyforscience.org/intel-isef-forms>



## SSEF / ISEF Forms

- ➔ In addition to Intel ISEF forms, download SSEF entry form from Science Centre website:

<https://www.science.edu.sg/for-schools/competitions/singapore-science-and-engineering-fair>

- ➔ For more details, please refer to: Intel ISEF International Rules and Guidelines 2020 **(DRAFT)**

<https://sspcdn.blob.core.windows.net/files/Documents/SEP/ISEF/2020/Rules/Book.pdf>

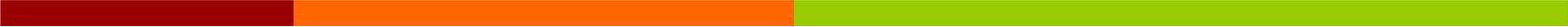


# SSEF / ISEF Forms

## ➤ Key Points to note:

- Please read forms carefully before completing them:
- MM/DD/YY format for ALL dates
  - ambiguous cases could imply non-compliance with SSEF/Intel ISEF rules
- Take note whether forms should be completed **before (most forms)** or **after (Form 1C, Form 5B)** the research has taken place





# Updates

## from Intel ISEF 2019



## Key Rule Changes

(mainly just clarifications / tweaks)

- Roles and Responsibilities of Students and Adults have been rewritten and reformatted
  - added **responsibilities for Qualified Scientists and Designated Supervisors** *NEW!*
- Expanded Ethics Statement (**to include adults involved** *NEW!*)
  - addresses integrity, legality, respect for confidentiality and intellectual property, and stewardship of the environment



integrity



legality



confidentiality



intellectual  
property



environment



## Key Rule Changes

(mainly just clarifications / tweaks)

### ➤ Human Participants Rules

- students are **prohibited** from **independently diagnosing disease**, administering medication and / or performing medical procedures
- IRB review and pre-approval is necessary when the student-designed invention, prototype, application, etc. is tested by human participants **other than the student researcher(s) or a single adult guardian or adult sponsor / QS / DS** when the testing requires an adult tester **NEW!**



## Key Rule Changes

(mainly just clarifications / tweaks)

### ➤ Potentially Hazardous Biological Agents (PHBA) Rules (rephrased)

➤ insertion of antibiotic resistance markers for the **clonal selection of bioengineered organisms is permitted**, with the following exceptions:

- students are prohibited from the insertion of antibiotic resistance traits or selection of organisms expressing traits that may **affect the ability to provide effective treatment of infections** acquired by humans, animals, or plants.
- students are prohibited from **designing or selecting for multiple drug resistance organisms (MDROs)** to investigate the pathology, development, or treatment of antibiotic-resistant infections.



## Reasons for Failed to Qualify (FTQ) for Intel ISEF 2019

- No Institutional Review Board (IRB) approval
- Home Lab (no Qualified Scientists involved)
- Practicing medicine without proper medical supervision
- Contamination of the environment (to test effectiveness of process / device)

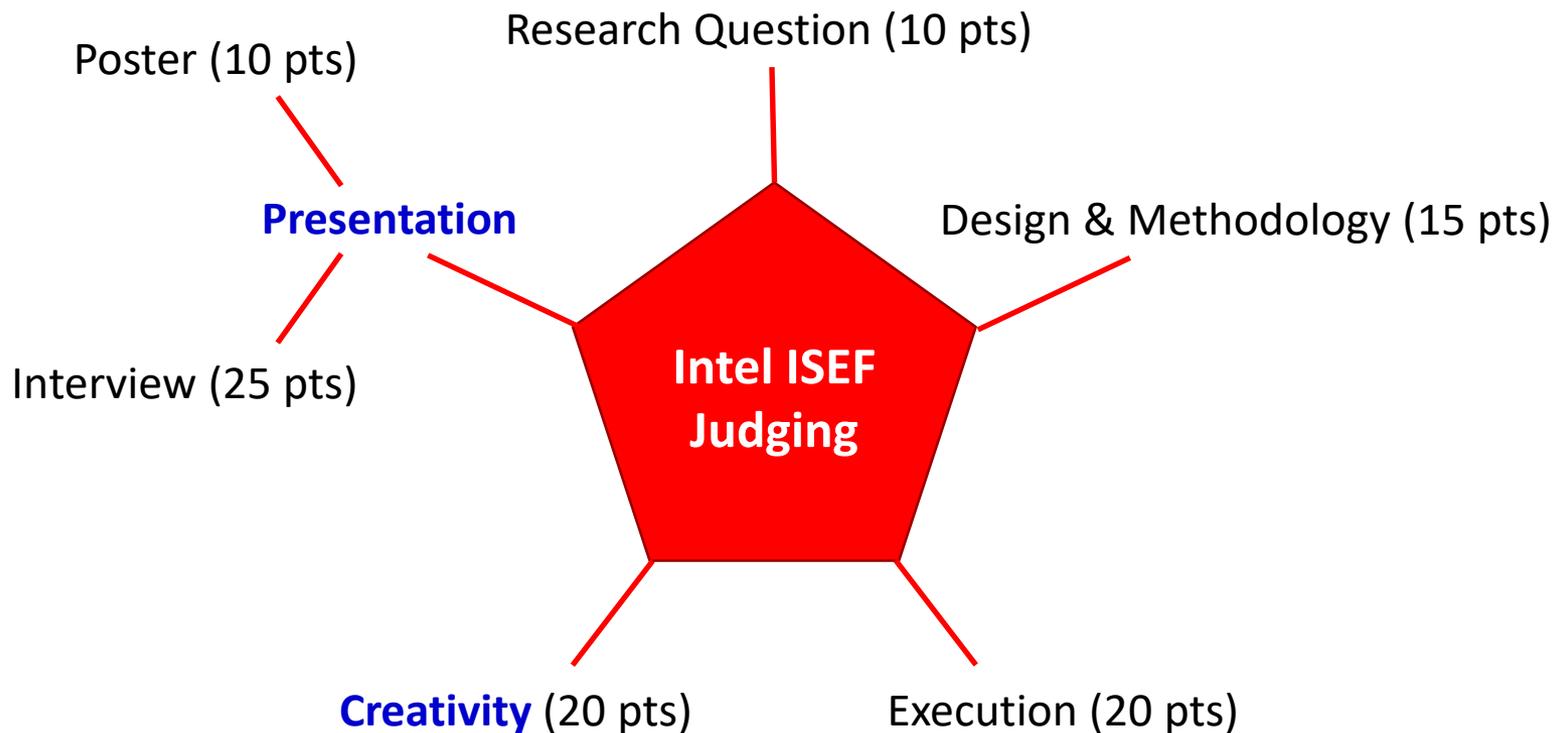
## Other Scientific Review Committee (SRC) Issues

- Conflict of interest: any adult involved with the project (AS / QS / DS) cannot be on the approving IRB or SRC
- Missing forms or signatures, dates wrong format, too much info
  - **info given in research plan could be used** to triangulate missing info required in forms



## Considerations for Judging

- Considerable emphasis was placed on two areas:  
***Creativity*** (20 pts) and ***Presentation*** (35 pts)





## Considerations for Judging

- Considerable emphasis was placed on two areas:  
***Creativity*** (20 pts) and ***Presentation*** (35 pts)
- Examples of ***creativity*** may include:
  - an unusual approach to answer a research question
  - a novel experimental design or apparatus
  - an innovative use of techniques or technologies
  - developing a new way to view, understand or interpret the results of the investigation

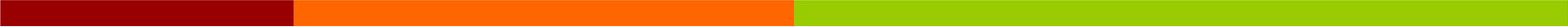
## Considerations for Judging



### ➤ Team projects vs Individual projects

are judged on the same basis except:

- need to evaluate the contribution to and understanding of the project for **each member** of the team (through **individual questioning**)
- additional criterion of “Teamwork”



# H3 Science Research

# Guidelines on the use of H3 Science Research Projects for SSEF

- H3 Science Research examination documents are **not** permitted for exhibition, competition or publication without the authorisation by the Chief Executive, SEAB

## Time Frame

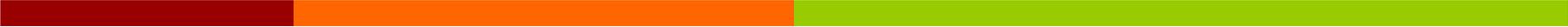
- Candidates must submit the H3 science research papers to the examining agencies and clear the Oral Defence of the science projects **before** the start of the SSEF in March.
- Candidates **should not** have any further contact with NUS / NTU / equivalent examination authority upon submission to the examining agencies when preparing for SSEF.



# Guidelines on the use of H3 Science Research Projects for SSEF

## Materials

- Candidates **should not** use the same H3 examination documents submitted to the examining agencies for the SSEF.
- The written report submitted for the SSEF is different from the H3 Science research paper submitted as an examination work.
- The mode used for the SSEF's oral presentation (poster) is different from the H3 Oral Defence (e.g. PowerPoint).
- Candidates **should not** make reference to the work submitted for the SSEF as having been an examination submission (e.g. by removal of examination labels, candidate index, title of H3 programme and examining agency).



# Guidelines on the use of H3 Science Research Projects for SSEF

## Results

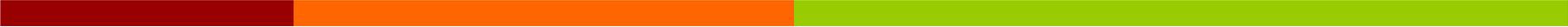
- Candidates **should not** use the results obtained from the SSEF as a basis to contest the results awarded by SEAB for the H3 science research programmes.

# Guidelines on the use of H3 Science Research Projects for SSEF

## Declaration (Teachers to note)

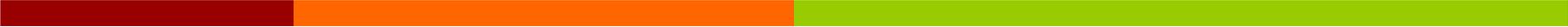
- Candidates in the H3 Science research programmes are required to submit a **declaration form** to Curriculum Policy Office (MOE) and acknowledge the conditions and implications for participation in the SSEF.
- Schools will collate and submit the declaration forms by first week of December 2019.





# Networking and Sharing of Practices





# Networking and Sharing of Practices

- Rationale:  
STEM / Science Research in its many forms is an enriching experience and it will benefit a wide range of students in our schools
- Sharing of practices by schools with well-established Science Research Programmes and exploration of possible collaborations
- To Nurture Science Research Talents (both in terms of absolute numbers and also the number and range of schools involved)





**Q & A?**

## Contacts

Mr Wong Yih Check	6879 6226 wong_yih_check@moe.gov.sg	For SSEF Matters
Mr Koh Siak Peng	6879 6583 koh_siak_peng@moe.gov.sg	
Ms Yang Yarong	6879 6603 yang_yarong@moe.gov.sg	
Ms Gerlynn Yap	6879 6842 gerlynn_yap@moe.gov.sg	
Mr Marcus Fa	6425 2500 marcus_fa@science.edu.sg	For ATS and SSEF matters





**Thank you for your kind  
attendance!!**