

Scheme to Identify & Nurture Scientific Temperament among Students through Knowledge and Awareness Mapping Platform (KAMP)

Introduction

Knowledge and Awareness Mapping Platform "KAMP" is an initiative and Knowledge Alliance of the **Council of Scientific and Industrial Research - National Institute of Science Communication and Policy Research (CSIR-NIScPR)**, a constituent laboratory of the Council of Scientific & Industrial Research, Ministry of Science & Technology with Industrial Partner M/S Nysa Communications Pvt. Ltd. (NCPL), Noida. KAMP was inaugurated by Prof. K. Vijay Raghavan (Former Principal Scientific Advisor-Govt. of India) and Dr Shekhar C Mande (Former Director General, CSIR) on 3rd April 2019.

Genesis of KAMP

KAMP is a platform to evaluate cognizance of skills, awareness, and knowledge of Science, Technology, Earth & Universe intending to develop the creativity and critical thinking abilities of the students; given the growing pace and complexity of the knowledge system, it has been realised that there is a critical need to assess student's knowledge and skill with a holistic approach to problem-solving.

By providing insights about the student's aptitudes and inclinations, along with actual performance and attitudes, such an evaluation is invaluable for parents, teachers and mentors, to chart the student's future course of education and choice of career – finding an optimum fit and even moulding attitudes.

Pandit Jawahar Lal Nehru coined the term "Scientific Temperament" and the need for its inculcation among individual citizens of the nation. Basically, the term refers to individuals' approach to forming an opinion, understanding issues and solving problems. For students and academicians, such a scientific approach need not be limited to mathematics and the sciences but to every discipline of study including earth & universe.

The nation's pool of students are resources for its future, among which school students are in their formative years. So, for a long, the CSIR has grappled with the issue of the temperament of our students. Do they primarily resort to rote learning? Do they unquestioningly accept dogma or prefer to follow the path of logical reasoning and analysis? Given that students are better motivated in imbibing education for which they have an aptitude – can such aptitude be identified?

Those at the forefront of education had been familiar with these issues for a long but conducting an appropriate study had posed difficulties. For it to be meaningful, any such study had to be undertaken on a vast scale. Such a study also had to be able to generate and collate data on an individual-to-individual basis. And it had to do so quickly for timely feedback to the concerned.

Scientific Temperament and its inculcation

The KAMP Vision: As stated this is to identify and assess 'Scientific and Technological Temperament' in students; to make India: "A Global Leader in the Field of Science, Technology & Humanities".

One of the pressing issues in India is that young students are not attracted to science as a career; therefore, there is a strong need to address the issue. The main objective of KAMP is to map the "*scientific temperament*" of young students and based on the resulting assessment, nurture them appropriately as future resources of the country. It believes that every student is blessed with a core talent and aims to bring out the best in them through this platform. It aims to inculcate the ability for critical thinking and fill in gaps that are identified at the end of the knowledge assessment phase.

Since the term is *specifically included in the Constitution of India* it needs a detailed examination. Scientific temperament refers to an individual's attitude toward logical and rational thinking. An individual is considered to have a scientific temper if he or she employs a scientific method of decision-making in everyday life. As pointed out earlier, the term was first coined by India's first Hon'ble Prime Minister, Pandit Jawaharlal Nehru, in his book 'The Discovery of India'.

"A Statement on Scientific Temper" prepared by a group of scholars and issued on behalf of the *Nehru Centre, Bombay, in July 1981*, stated that "Scientific Temper" involves the acceptance, amongst others, of the following premises:

- The method of science provides a viable method of acquiring knowledge;
- Human problems can be understood and solved in terms of knowledge gained through the application of methods of science;
- The fullest use of the method of science in everyday life and every aspect of human endeavour, from ethics to politics and economics, is essential for ensuring human survival and progress; and,

- That one should accept knowledge gained through the application of methods of science as the closest approximation of truth at that time and question what is incompatible with such knowledge; and that one should, from time to time, re-examine the basic foundations of contemporary knowledge.

As India strove to throw off British rule, the political leadership, influenced strongly by the builders of the nuclear and space programmes, recognised the need for science in development. In 1958, the Government published its Scientific Policy Resolution, which stated, “The dominating feature of the contemporary world is the intense cultivation of science on a large scale, and its application to meet a country’s requirements.”

When the fundamental duties were added to the Constitution in 1976 through *Article 51A*, the *eighth duty* stated: “It shall be the duty of every citizen of India to develop the scientific temper, humanism and the spirit of inquiry and reform.” This made the Constitution one of the few that requires the spirit of inquiry and scientific temper as a foundational aspect of society. Jawaharlal Nehru in *The Discovery of India*, writes, “Scientific temper is a way of life — an individual and social process of thinking and acting which uses a scientific method which may include questioning, observing reality, testing, hypothesising, analysing and communicating.”

Scientific temper can be viewed through two lenses — one of the traditional scientific community, and the other of society as a whole. Before Independence, India had leading colonial scientists, such as the botanist Fr. Eugene Lafont, who partnered with others to establish the Indian Association for the Cultivation of Science, and J.J. Evershed in the Nilgiris after whom the Evershed flow effect in the chromospheres, is named. But there were also internationally recognised Indian scientists such as K.S. Krishnan, C.V. Raman and others who developed their fields but largely on an individual basis. In independent India, the move from competitive individualism to institution-building was supported by the government and its policies.

The Indian Constitution on Scientific Temperament

- Article 51 A of our constitution which deals with fundamental duties makes it a duty of every citizen to develop a Scientific Temper; (as per clause [h]). It is the Scientific Temper that helps in developing Secularism, Humanism & Spirit of enquiry and reform.
- The Government of India, through the National Council for Science and Technology Communication, dedicated the 28 February National Science Day of 2014 to the theme "Fostering Scientific Temper"

Objectives

1. To foster a STEM-based learning environment.
2. To shift the focus from Rote Learning to the development of Scientific Temper.
3. To create awareness of Scientific & technological establishments among aspiring students, through various excursion programs.
4. Exposure to the new trends and development in Science, Technology & Earth Sciences.
5. Providing training in the scientific method and how to apply it to everyday life.
6. Fostering a culture of openness, transparency, and collaboration in scientific research and dissemination of information.
7. Disseminating accurate and up-to-date information about science, technology, and medicine to the schools, students and parents.
8. Promoting a multidisciplinary approach to solving complex problems and encouraging interdisciplinary collaborations.
9. Promoting science literacy and public understanding of science and its role in society.
10. To infuse a healthy competitive spirit through rewards, based on performance levels.
11. To create a performance index for all the participating schools/institutions.

About NASTA

National Assessment for Scientific Temperament & Aptitude

Under KAMP, a National Assessment for Scientific Temperament and Aptitude (NASTA) unit was designed and developed to identify and promote scientific temper among students.

As one of the primary initiatives under KAMP, it is a set of processes including an examination. It is an Attribute-Based assessment rather than being only Subject-Based. NASTA provides educators, policymakers, and parents with a common measure of student achievement. NASTA is designed for students of classes 5 to 12.



Relevance of NASTA

- NASTA takes a comprehensive, integrated approach to map the scientific temperament of young brains.
- Through conceptual development, NASTA builds an understanding in students of the scientific aspects of every kind of study.
- Through it, students begin to appreciate their hidden talents. They also conduct their self-assessment on its platform.
- It nurtures the scientific aptitude in students.

Impact and Outcome

- It conducts Continuous Identification of the “how” and “why” of learning outcome levels of students in India and abroad.
- By doing so it becomes a comprehensive advisory for students/parents/ teachers that facilitates identifying the student’s areas of strength.
- The Data and Analytics generated about current learning levels provide decision-making support for policymakers.
- It provides advisory support to schools about providing an enabling environment to identify students with unique skills.
- It directly benefits students by nurturing their skills/talents through sub-units such as the KAMP Centre of Excellence (COE).
- Provides necessary curricular inputs to policymakers.

KAMP – NASTA for:

1. Self-Financed/Private Schools/institutions

Assessment Summary:

| Mode | Online/Offline |
|---|---|
| Type of Questions | Multi Choice Questions (MCQ's) |
| Registration | Registration will be done online through https://kamp.res.in . School Registration: School will register on https://kamp.res.in and register their students from their login. |
| (5th – 10th) Duration No. of Questions Subjects | Paper 1 60 Minutes 40 Questions (Science & Mathematics, Earth & Universe, IT/Computers) |
| (5th – 10th) Duration No. of Questions Subjects | Paper 2 60 Minutes 40 Questions (Aptitude and Reasoning) |
| (11th – 12th) Duration No. of Questions Subjects | Paper 1 90 Minutes 80 Questions (Aptitude and Reasoning) |
| Participation Fee | Rs. 400/ Student |
| Medium | English/Hindi/Regional Language* |
| Visits for Toppers | Visit to Leading Science Research Institutions/Organizations* |
| Fortnightly Workshops (Jr. Scientist Club) | Online fortnightly workshops for all Registered Students for one year |
| Knowledge Resources | Online access to CSIR journals, newsletters, magazines, podcasts etc. to all registered students |
| Events | Opportunity to participate in events like India International Science Festival (IISF), Indian Science Congress (ISC) etc. |
| Assessment Report | A comprehensive student report and advisories for all participants. |

Awards & Scholarships:

| AT NATIONAL LEVEL | | |
|-------------------|--|-----------|
| RANK | AWARDS & SCHOLARSHIPS | Total No. |
| 1st | Rs. 10,000/- + Gold National Award + Certificate of Outstanding Performance | 8* |
| 2nd | Rs. 5,000/- + Silver National Award*+ Certificate of Outstanding Performance | 8* |
| 3rd | Rs. 2,500/- + Bronze National Award*+ Certificate of Outstanding Performance | 8* |

Scholarship distribution will be as per the following student participation:

- Upto 10K student participation – Scholarships will be given to 1st Rank Holders
- Upto 20K student participation – Scholarships will be given to 1st & 2nd Rank Holders
- Upto 50K student participation – Scholarships will be given to 1st, 2nd & 3rd Rank Holders

* In case two or more students achieve the same National Rank, cash award in the applicable category will be distributed as under:

- For up to 5 students getting the same rank, the award amount will be distributed equally. In addition, each winner will be awarded a medal (in the applicable category) and a Certificate.

| AT STATE LEVEL | | |
|----------------|--|-----------|
| RANK | AWARDS & SCHOLARSHIPS | Per State |
| 1st | Rs. 2,000/- + Gold State Award* + Certificate of State Excellence | 8* |
| 2nd | Rs. 1,000/- + Silver State Award*+ Certificate of State Excellence | 8* |

Scholarship distribution will be as per the following student participation:

- Upto 5K student participation – Scholarships will be given to 1st Rank Holders
- Upto 10K student participation – Scholarships will be given to 1st & 2nd Rank Holders

* In case two or more students achieve the same State Rank, cash award in the applicable category will be distributed as under:

- For up to 5 students getting the same rank, the award amount will be distributed equally. In addition, each winner will be awarded a medal (in the applicable category) and a Certificate.

| AT DISTRICT LEVEL | | |
|-------------------|--|--------------|
| RANK | AWARD & CERTIFICATE | Per District |
| 1st | Medal of Excellence* + Certificate of Excellence | 8* |

* Minimum of 100 per class student participation is required at the District Level.

* 1 student each from classes 5th – 12th will be selected for District Topper.

*In case two or more students achieve the same District Rank, up to 3 students' medals and certificates will be awarded.

| AT CLASS LEVEL | |
|--|--|
| **Top 3 scorers - Gold, Silver, and Bronze Medal + Certificate of Class Excellence | |
| ** Minimum of 20 students participation is required from Each Class | |

- **Participation certificates** to all registered students.
- **Certificates** to KAMP Nodal Officer & Memento for Schools*
- **To win the Scholarship Minimum of 100 students participation is required from the School.**

Pattern of Funding (Self-Financed Schools/institutions):

Participation fees for Self-Financed Schools/institutions shall be borne by students and shall be deposited by the school or student. After deducting Rs. 30/- per student (towards expenditure for examining their school premises), the school has to pay the total registration fee (online Net Banking, NEFT/RTGS, UPI, or Card Payments) through the Kamp portal.

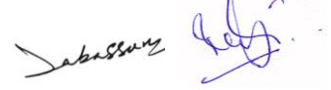
Utilization of Fees under Various Heads:

| Sr. No. | Activity | Unit Cost (Rs.) |
|--------------|--|-----------------|
| 1 | Capacity Building & Outreach | ₹ 60.00 |
| 2 | Expense towards conduction of NASTA assessment | ₹ 135.00 |
| 3 | Awards/Medals/Certificates/Scholarships | ₹ 35.00 |
| 4 | Scientific Excursions & Outreach | ₹ 40.00 |
| 5 | Trainings & Workshops | ₹ 35.00 |
| 6 | Administrative Expense | ₹ 65.00 |
| 7 | Implementation Charges to School | ₹ 30.00 |
| Total | | ₹ 400.0 |

2. Government/Govt. Aided Schools/institutions (At Central Level):

Assessment Summary:

| Mode | Online/Offline |
|---|---|
| Type of Questions | Multi Choice Questions (MCQ's) |
| Registration | Registration will be done online through https://kamp.res.in . School Registration: School will register on https://kamp.res.in and register their students from their login. |
| (5th – 8th) Duration No. of Questions Subjects | Paper 120 Minutes 80 Questions (Science, Mathematics, Earth & Universe, IT, Aptitude/Reasoning) |
| (9th – 10th) Duration No. of Questions Subjects | Paper 120 Minutes 80 Questions (Science, Mathematics, Earth & Universe, IT, Aptitude/Reasoning) |
| (11th – 12th) Duration No. of Questions Subjects | Paper 90 Minutes 80 Questions (Aptitude and Reasoning) |
| Participation Fee | Rs. 300/ Student |
| Medium | English/Hindi/Regional Language* |
| Visits for Toppers | Visit to Leading Science Research Institutions/Organizations* |
| Fortnightly Workshops (Jr. Scientist Club) | Online fortnightly workshops for all Registered Students for one year |
| Knowledge Resources | Online access to CSIR journals, newsletters, magazines, podcasts etc. to all registered students |
| Events | Opportunity to participate in events like India International Science Festival (IISF), Indian Science Congress (ISC) etc. |
| Assessment Report | A comprehensive student report and advisories for all participants. |



Awards & Scholarships:

| AT NATIONAL LEVEL | | |
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| RANK | AWARDS & SCHOLARSHIPS | Total No. |
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| 2nd | Rs. 5,000/- + Silver National Award*+ Certificate of Outstanding Performance | 8* |
| 3rd | Rs. 2,500/- + Bronze National Award*+ Certificate of Outstanding Performance | 8* |

* In case two or more students achieve the same National Rank, cash award in the applicable category will be distributed as under:

- For up to 5 students getting the same rank, the award amount will be distributed equally. In addition, each winner will be awarded a medal (in the applicable category) and a Certificate.

| AT STATE LEVEL | | |
|----------------|--|------------|
| RANK | AWARDS & SCHOLARSHIPS | Per State. |
| 1st | Rs. 2,000/- + Gold State Award* + Certificate of State Excellence | 8* |
| 2nd | Rs. 1,000/- + Silver State Award*+ Certificate of State Excellence | 8* |

* In case two or more students achieve the same State Rank, cash award in the applicable category will be distributed as under:

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| **Top 3 scorers - Gold, Silver, and Bronze Medal + Certificate of Class Excellence | | |
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- **Participation certificates** to all registered students.
- **Certificates** to KAMP Nodal Officer & Memento for Schools*
- **Scholarships** are applicable on a minimum of 1 lac student participation.

Pattern of Funding:

Participation fee for Govt./Govt. aided schools/institutions and Education Institutions under MHRD/Central Govt./State Govt./Minorities Institutions etc. shall be borne and paid by respective Education Board/Department/School through (online Net Banking, NEFT/RTGS, UPI, or Card Payments).

Concern Education boards/departments/institutions may create a facility to enrol students jointly or direct the Principals/Head of schools/institutions/Institutions under your jurisdiction, to upload enrolled students' data online for the above said assessment through the KAMP website <https://www.kamp.res.in>.

Utilization of Fees under Various Heads:

| Sr. No. | Proposed Activity | Unit Cost (Rs.) |
|--------------|--|-----------------|
| 1 | Expense towards conduction of NASTA assessment | ₹ 125.00 |
| 2 | Awards/Medals/Certificates/Scholarships | ₹ 35.00 |
| 3 | Scientific Excursions & Outreach | ₹ 40.00 |
| 4 | Trainings & Workshops | ₹ 35.00 |
| 5 | Administrative Expenses | ₹ 65.00 |
| Total | | ₹ 300.0 |

3. Government/Govt. Aided Schools/institutions (At State Level):

Assessment Summary:

| Mode | Online/Offline |
|---|---|
| Type of Questions | Multi Choice Questions (MCQ's) |
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AT DISTRICT LEVEL

| RANK | AWARDS & SCHOLARSHIPS | Per District. |
|------------|--|---------------|
| 1st | Rs. 2,000/- + Gold Medal of Excellence* + Certificate of District Excellence | As per actual |
| 2nd | Rs. 1,000/-+ Silver Medal of Excellence **+ Certificate of District Excellence | As per actual |

*** In case two or more students achieve the same District Rank, cash award in the applicable category will be distributed as under:**

For up to 5 students getting the same rank, the award amount will be distributed equally. In addition, each winner will be awarded a medal (in the applicable category) and a Certificate

AT CLASS LEVEL

| |
|--|
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Concern Education boards/departments/institutions may create a facility to enrol students jointly or direct the Principals/Head of schools/institutions/Institutions under your jurisdiction, to upload enrolled students' data online for the above said assessment through the KAMP website <https://www.kamp.res.in>.

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| 5 | Administrative Expenses | ₹ 65.00 |
| Total | | ₹ 300.0 |

KAMP – NASTA Implementation Guidelines

The implementation of KAMP will be held in schools in the following manner:

SCHOOL ENROLLMENT

All schools should enrol online through the KAMP website www.kamp.res.in. Login credentials will be sent to the school on a registered E-Mail ID. School Kit (Information Brochure, Student Registration Forms, Detailed Guidelines and other Communication Materials) are available on the KAMP website www.kamp.res.in.

KAMP – NODAL OFFICER

The Head of School is requested to assign a KAMP-NODAL OFFICER (School Principal is Preferable) and submit his/her details on KAMP Portal while School Enrolment. KAMP Nodal Officer shall be responsible to give wide publicity to this initiative among students, teachers and parents to activate the scientific instinct in students to find solutions to day-to-day problems. They are requested to persuade every class teacher to motivate students to participate in large numbers.

STUDENT REGISTRATION

The details of participating students will be uploaded by School/Nodal Officer on KAMP Portal through the respective school's Login. Required training for the same shall be provided to schools through the KAMP support centre. An individual student can also register directly through the KAMP portal (for registered schools only).

REGISTRATION FEE

Each participating student has to pay the registration fee. The enrolled schools shall pay the registration fee for all the enrolled students.

ASSESSMENT/IMPLEMENTATION DETAILS

Preparation tips for students, Syllabus for NASTA, Sample Questions, Exam Conduction Guidelines, and Assessment Pattern details can be accessed through www.kamp.res.in. Examination material will be delivered directly to the school closer to the date of examination in case of offline mode. A mock assessment facility will be provided under student login.

ASSESSMENT REPORT

The assessment Report will be available online under schools/institutions login. All participants will receive a comprehensive assessment report with an advisory under their respective student's login.

AWARDS & CERTIFICATES

The award ceremony shall be organised to acknowledge the outstanding performers. The participation certificates may be sent to schools for distribution.

SCIENTIFIC EXCURSIONS

Scientific excursions to various CSIR laboratories/research institutes, ISRO labs/facilities etc. may be organised for the outstanding performers. The venue will be decided on the basis of approval from the concerned laboratories/institutions and will be communicated to the schools. Other schools & students may also participate in the excursions on a paid basis.

STUDENT ENGAGEMENT PROGRAMS

Fortnightly sessions/workshops on Thursdays at 4:00 PM will be organized by KAMP in the following categories: Science, Technology and Innovations, Scientific and Life Skills, Career & Professional Development, Academic Development, and Train the Trainers/Teachers. All the registered students under KAMP NASTA 2023 can participate in these annual sessions at no cost. The joining link will be available under the student login

For any further information or implementation, write us at info@kamp.res.in, support@kamp.res.in.