한과영 2023-007

20th Anniversary

20 years of Challenge, 20 years of Leap!

CREATIVITY·PASSION·SERVICE

LEADING THE FUTURE

Korea Science Academy of KAIST

KOREA SCIENCE ACADEMY OF KAIST

Initiatives

The First National Science Academy in Korea for the Gifted

· Best education with excellent teachers and students
· Specialized curriculum for science-gifted students: research-centered learning, intensive education in math & science, convergence education, and globalization

The Only Secondary School under the Ministry of Science and ICT

· Stable budget and operation under the ministry's direct supervision
· Support by the national government to foster and optimize young talent

The Home of Future Scientists Growing with KAIST (Korea Advanced Institute of Science and Technology)

· Affiliation with KAIST, world-class university in science & technology
· College-level researches, lectures, and convergence education

Specialties

Research-oriented Education Aimed at Nurturing Creative Scientists

- High-tech labs and equipments
- R&E program through student-centered research projects, mentoring-based graduation research
- High-profile teachers with professionalism recruited for the purpose of cultivating promising world-level scientists

Global Education through International Partnerships and Network

- Development of leadership and global perspectives through international exchange programs
- Various opportunities to enhance academic and research abilities through international collaborative research, on-site research, and long & short-term exchange programs with partner schools abroad
- Globalized campus with foreign students and teachers, lectures taught in English, and operation of international programs

Advanced Education in Collaboration with KAIST

- Opportunity to earn college credits through KSA AP (Advanced Placement) and courses taken at KAIST by KSA HP (Honors' Program)
- Opportunity to carry out graduation research under the guidance of KAIST professors through KAIST HRP (High school Research Program)
- Opportunity to attend lectures by KAIST professors

Visions

Innovating Science Education

· Creative education free from the college entrance exam
· A learning journey to explore science and find oneself

Fostering Pioneers Who Will Open Up New Horizons Leading to the Future

· Top-tier science talents endowed with academic enthusiasm and exceptional research capabilities
· Leaders of the global community with creativity and convergent thinking

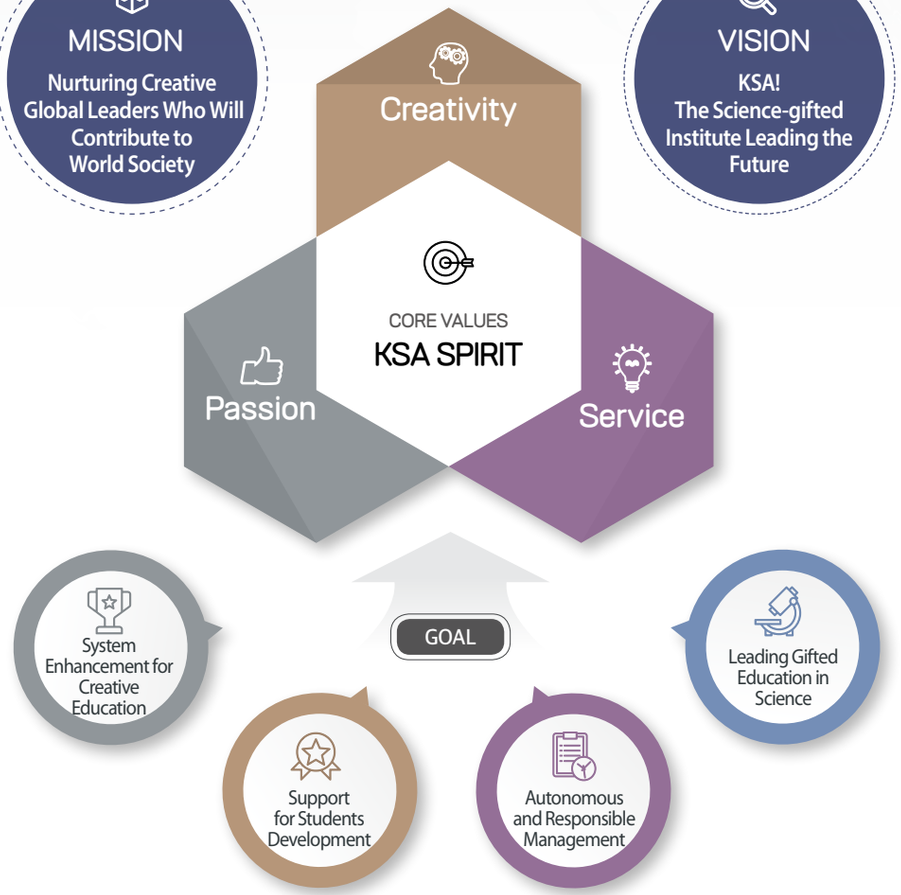
Nurturing Talents Who Can Work for the Humankind

· Values through new research and inventions
· Contributing to the betterment of human life

The First National Science Academy in Korea for the Gifted

MISSION
Nurturing Creative Global Leaders Who Will Contribute to World Society

VISION
KSA!
The Science-gifted Institute Leading the Future



< Close-knit Connection with KAIST >

Proud Home of Future Scientists

As the only science-gifted institute whose entire budget comes from the government, KSA has been striving to reach the top level of the world's best schools for science-gifted students.

Students

(As of Mar. 2023)

Grade	Grade 10			Grade 11			Grade 12			Total		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
No. of Students	112	33	**145**	105	30	**135**	112	15	**127**	329	78	**407**
No. of Classes	12			12			12			36		

※ 29 international students included
※ 3 RAA classes operated separately

Faculty

(As of Mar. 2023)

Category	Principal	Vice Principal	Full-time teachers		Dispatched by BMCOE*	Temporary teachers	Total
			Korean	Foreigner			
No. of persons	1	1	50	5	6	2	**65**

※ 100% of science and math teachers have Ph.D. degrees.
※ BMCOE*: Busan Metropolitan City Office of Education

Staff

(As of Mar. 2023)

Category	Administrative staffs							Engineers, etc.			Total
	Administrative Officer	Admission Officer	Computer Technician	Dormitory Staff	Counselor	Librarian	School Nurse	T.A.	Engineers	Cafeteria Staff	
No. of persons	27	3	3	2	2	1	1	6	5	11	**61**

Facility

(As of Mar. 2023 / Unit : m^2)

Site Area (59,180)			Building Area (36,635)								
Buildings	Athletic Field	Roads	Main Bldg	Tamgu - Gwan	Hyeong seol - Gwan	Changjo - Gwan	Dream Design Center	Yeji - Gwan	Baeg yang - Gwan	Dormitory	Others
54,213	4,670	297	6,484	4,805	4,172	5,460	984	4,304	1,284	8,859	283

KSA History

KOREA SCIENCE ACADEMY OF KAIST

KSA was officially designated as the first school for science-gifted students in 2003. It became affiliated with KAIST, world-class university in science and technology in 2009. Since then, KSA has continued to produce future global leaders in math & science under the strong support from KAIST.

1991
03. The 1st Entrance Ceremony of Busan Science High School

2002
05. Designated and Converted to a Science-gifted Institute

2003
03. The 1st Entrance Ceremony as the Science-gifted Institute

2005
07. Renamed as Korea Science Academy

2009
02. Affiliated to KAIST (Korea Science Academy of KAIST)

2013
11. 10th Founding Anniversary as the First Science-gifted Institute in Korea

2017
06. Hosted International Student Science Fair 2017 (ISSF 2017)

2020
02. Inauguration of the 10th Principal Dr. Jong Bae Choi

2023
02. Entrance Ceremony (142 students / 12 int'l students included)
20th Anniversary of KSA

Customized Curriculum

KSA offers a differentiated curriculum with an aim to prepare gifted learners in science to lead the future of science in Korea. The curriculum is focused on offering student-centered and individualized education to develop capabilities and qualities of students. KSA is also strongly committed to supporting students' creative research activities to nurture them as well-rounded global leaders.

Curriculum Organization

Academic Courses (127 credits)	• Natural Science (67 credits) • Humanities (52 credits) • Convergence (8 credits)
Creative Research Activities (28 credits)	• Creative Basic Research (6 credits) • Self - directed Small Group Research, and Domestic & Int'l On-site Research (16 credits) • Graduation Research (6 credits)
Competency-based Leadership Activities (Over 270 hours)	• Career Development Activity (at least 60 hours) • Cooperation Activity (at least 60 hours) • Global Citizenship Activity (at least 60 hours)

Academic & Curriculum

- **Credit-based Graduation System (155 credits)**
- **Required Courses (66 credits):** Accelerated completion of mandatory courses of high school education
- **Elective Courses (53 credits):** Advanced courses, including AP recognized as college credits
- **Convergence Courses (8 credits):** Courses combining two or more academic disciplines
- **Intensive required courses:** Students shall complete at least three intensive required courses in two or more subjects
- Credit acceptance through the academic exchanges with science-gifted institutes at home and abroad
- Operation of subject classroom system

Subject Operation

- **Use of English as medium of instruction:** Some subjects among mathematics, science, physical education and arts, and all English subjects taught in English
- **Operation of student-centered customized curriculum:** Accelerated/intensive education such as PT and AP, offering of courses by level, and operation of self-designed curriculum
- Strengthening of investigation, discussion, and writing skills

Pass/Fail Evaluation system

- Pass/Fail (complete/incomplete) evaluation implemented for first-year mandatory courses based on the concept of competency-based mastery learning

PT (Placement Test)

- Credit acceptance through the PT without taking courses
- **Applicable courses:** first-year mandatory courses

KSA AP (Advanced Placement)

- KSA course credits transferred to leading domestic universities
- AP agreements with KAIST, POSTECH, UNIST, DGIST, and GIST

KSA HP (Honors' Program)

- Accelerated advancement opportunity for outstanding students
- Taking courses at KAIST in 3rd year
- Course credits accepted by KSA and KAIST

Creative·Innovative Convergence Education

- **Dream Design Center (DDC):** Utilized to provide educational opportunities with a focus on the generation of creative·multidisciplinary ideas (implementation of maker education; establishment and operation of Creative Convergence Design)
- **Creative Engineering:** Designed to meet students' demand for engineering and help students to find a career path/Focused on energy, nano, space, robot, and bio-technologies, etc.
- **Convergence Education:** Intended to cultivate problem-solving abilities and interdisciplinary thinking through integrated education of math, science, humanities, and arts

Student-oriented / Learner-engaged Education

- Operation of classes with increased student participation through experiments, discussions, team assignments, etc.
- Operation of Learning Management System (LMS) for participation-based classes
- Establishment of Active Learning Classroom (ALC) for participation-based classes
- Offering of various lectures in conjunction with KAIST Edu 3.0

Creative Research

The future of our society depends upon talented individuals, who think and act with a creative mindset, based on diverse experiences, respect of different opinions, and innovative ideas. KSA offers stepwise creative research activities to help science-gifted students become self-directed thinkers and action-takers so that they can realize their dreams.

Year-by-Year Creative Research Activities

Grade	Type	Courses
10	Creative Basic Research	• Creative Design Activities • Seminar on Basic Research Methodology
11	Self - directed Small Group Research	• R&E • Domestic & Int'l On-site Research
12	Graduation Research	• Individual Research or KAIST HRP

Creative Basic Research

- **Creative Design Activities:** Learning about the desirable qualities of researchers and adopting creative thinking through opportunities to explore areas of research in math and science; Building of scientific inquiry skills to foster science and technology talent for the 4th industrial revolution; Maker education introduced to enhance project oriented education and problem-solving capacities
- **Seminar on Basic Research Methodology:** Conducting research on a topic of interest and gaining skills on report writing and problem identification in small group; Established in the form of pre-R&E to lay the groundwork

R&E (Research & Education)

- An opportunity to experience professional research by participating in a small group research project for one year and writing a thesis under the guidance of their advisors; Students explore career paths as future scientific leaders based on a solid research network connecting the KSA to universities and research institutes

Graduation Research

- **Individual Research:** Under the guidance of a KSA teacher, researching and writing a graduation thesis
- **KAIST HRP (KAIST High school Research Program):** Performing research and writing a thesis individually under the guidance of a KAIST professor

RAA (Research-centric Academic Advisor)

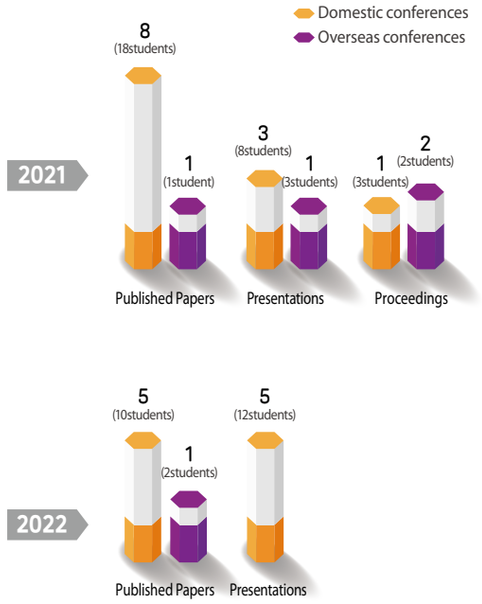
- A research-oriented system in which grade 10 to 12 students, under the guidance of an academic advisor, are assigned to a class to establish a mentor program between junior and senior students

Dream Design Center

- Establishment of idea generation and development space for students to apply their creativity and imagination while utilizing scientific knowledge and advanced equipment
- Utilized as an incubator for students to develop their ideas into intellectual property and contribute to society
- A space for students to explore intellectual property by developing their ideas and creating products that contribute to society

Outstanding Research Results Presented at Home & Abroad

- Publication of research: SCI 1 time, KCI 1 time



Globalization

KSA runs a number of international research and exchange programs that allow students to gain more opportunities on the global stage. Through the special chances, students gain cultural experiences and vast knowledge, and develop foreign language proficiency, expertise and creativity. This prepares them as leading scientists in Korea, who can compete at a global level and heighten the status of Korea as a scientific and technological powerhouse in the world.

Int'l Academic Exchange Programs

- **Int'l On-site Research:** Conducting the advanced research in globally renowned research institutes
- **Int'l Collaborative Research:** Conducting the research with prestigious science-gifted institutes overseas
- **Int'l Science Conference & Int'l Conferences for Talented Students in Science:** Presenting students' excellent research results in the global stage

Global Education

- **Exchange agreements with 21 institutes in 11 countries**
- **International Class**
  - Outstanding foreign students selected from all over the world since 2010
  - International Students in 2023 : Total 29 students (12 students in 1st grade, 9 students in 2nd grade, 8 students in 3rd grade)

- **Lectures in English**
  - Some of the Math and Science courses and all the English language courses
  - Adopted the 'Minimum Credit Requirement for English Courses System' since 2012
- **ECC (English Communication Center)**
  - Special programs for students to improve and refine their English skills, and learn customized high-level English
- **Student Exchange Program**
  - An opportunity to experience curricula and culture exchange with premier institutes abroad
  - Short Term (1 week): 5 countries, 6 institutes
- **Teacher Exchange Status (As of 2022)**

Division	Nation	Institutes	Date
Invitation	Thailand	Mahidol Wittayanusorn School	2022. 2. ~ 5.
Online	Singapore	National Junior College	2022. 11. 11.

KSA Science Fair (KSASF)

- A science festival to share scientific minds, research together, and demonstrate young scientists' creativity with science-gifted students from around the country and all over the world
- Even years (domestic fair) and odd years (international fair)

Leadership

KSA provides a variety of leadership programs to cultivate students with intellect and good character. By fostering creative problem-solving and leadership skills, students can set their own goals and visions, and paint a bigger picture as leaders.

Competency-based Leadership Activities

- **Global leaders with well-rounded development of intellect, morality, and physique**
- **Career Development Activity:** Participation in leadership activities, lecture activities, reading activities, career activities, character building activities, academic activities, etc.
- **Cooperation Activity:** Participation in student club activities, experiential activities, sports activities, etc.
- **Global Citizenship Activity:** Participation in school volunteering activities, external volunteering activities, overseas exchange, etc.

Community Service

- **Talent Donation:** Tutoring/Mentoring the local community students
- **Math/Science Camp:** for students from low-income families in Busan
- **Sharing Events for the Local Community:** Talent donation concert, No leftover food day, etc.

Mentorship Program

- Teaching and learning program with senior and junior students as well as fellow classmates to share their knowledge in their field of expertise

Student Festivals

- **SAF (Science Academic Festival):** Science activity-oriented festival including science and quiz contests, and astronomical observation
- **SAC (Science Adventure Celebration):** Performances and exhibitions organized by student clubs highlighting various interests and cultural experiences

Unique Programs

- Scientists' House
- KSA Invited Lectures
- KSA Forum for Science-gifted Education
- Rowing Team / Archery Team
- Center for Student Growth
- Sports and Cultural Exchange with KMLA (Korea Minjok Leadership Academy)

Financial Aids

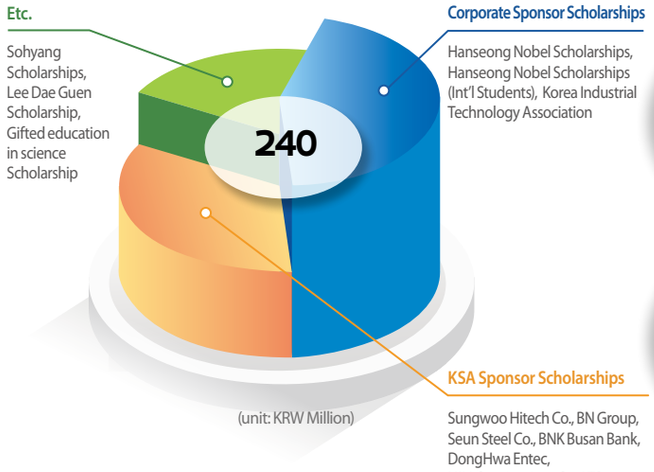
KSA offers a wide range of scholarships to support our students to grow as creative global leaders, who will enhance national competitiveness in science and technology, and contribute to the mankind.

Type of Scholarships

- **KSA Sponsor Scholarships:** Students with excellent academic and/or research performance
- **Corporate Scholarships:** Students who meet the requirements of each company's ideals
- **Lee Dae Guen Scholarship:** Students with excellent academic and/or research performance, as well as those who are socially underprivileged
- **Need-based Scholarships:** Int'l students and low-income students

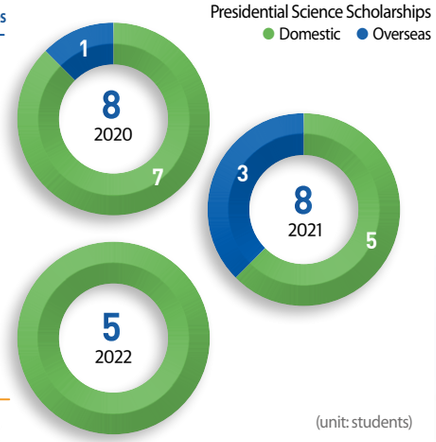
Scholarships offered in 2023

- **Scholarships for Current Students**



(unit: KRW Million)

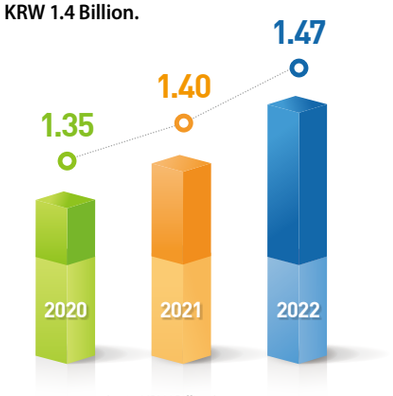
- **Scholarships for Graduates**



(unit: students)

KSA Development Fund (As of Feb. 2023)

- **KSA surpassed the fundraising milestone of KRW 1.4 Billion.**



(unit: KRW Billion)

- Started as a fundraising campaign among faculty and staff (a total of KRW 160 million was donated)
- Small donations from current students, graduates, and parents by bank transfer are rising.
- Donations made to development fund through profits from campus events and parents' association.

Future Operation of the Fund

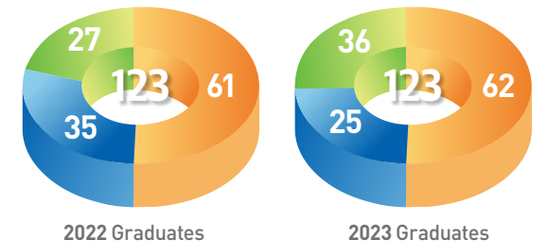
- Stabilization of development fund operations and fund acquisition
- Fundraising strategies including activating alumni associations, and devising ways to boost participation of parents
- KSA will also seek to attract donations from large corporations and expand partnership with the Development Fund of KAIST.

Graduation

Students are admitted to universities through special admission process, with the majority furthering their education at KAIST, SNU, POSTECH, and other prestigious universities at home and abroad.

Admissions to Universities

(Unit: students)



● KAIST ● Seoul National Univ. ● POSTECH, UNIST, Yonsei Univ., Korea Univ., etc

※ 100% of students pursuing science and engineering majors in recent 9 years
※ Admission to overseas universities in 2023: To be confirmed after September 2023

Support for Study Abroad

- Administer the College Board AP exams and Support for SATs
- Hosting information sessions by prestigious universities overseas
- Establishing abroad graduates network and academic mentoring

Admissions to Overseas Universities

- **119 students (2005~2022)**
  U.S.A. (Harvard Univ., etc.), U.K. (Univ. of Oxford, etc.), Japan (Tokyo Univ., etc.), Canada (Univ. of Toronto), Germany (Jacobs Univ.), China (Chinese Univ. of Hong Kong), New Zealand (Univ. of Auckland)

Admission

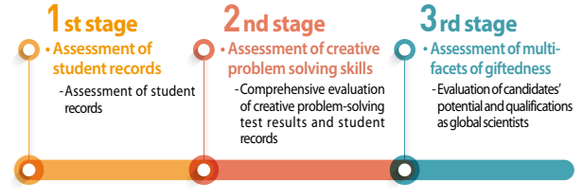
The school endeavors to recruit diverse talent through various admission categories: General, Jangyeongsil (domestic) and International.

Qualifications

- **Ideal qualities of KSA students**
  - Excellence and creativity in mathematics or science
  - Love for challenges, passionate, and ambitious
  - Capable of self-directed learning and creative thinking, and vast potential
  - Observes principles and shows consideration towards others
  - Intends to continue gifted learning at a university specializing in science and technology
- **General Track**
  - Screening mainly conducted by admissions officers
  - Evaluated comprehensively based on student records, creative problem-solving skills, giftedness, etc.
  - Held in June to August every year (around 96 students)
- **Jangyeongsil Track**
  - Used to attract students who are highly talented in either mathematics or science
  - Evaluated based on student records, oral exam and interview (no paper-based exam)
  - Recruited year-round through long-term observations and recommendations (around 24 students)
- **International Track**
  - Used to recruit talented international students in mathematics and science
  - Evaluated based on student records, oral exam, and interview
  - Aims to instill a global mindset built on diversity and mutual respect

Selection Process

- **General Track**



- **Jangyeongsil Track**
  - Early action based on recommendation
    - Admissions officer interview and comprehensive oral exam
- **International Track**
  - 1st stage: Assessment of Student Records
  - 2nd stage: Assessment of Oral exam in Math and English Interview

KSA

Leading the future!

This work was funded by the Ministry of Science and ICT.

KOREA SCIENCE ACADEMY OF KAIST

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