

# KSA

KOREA SCIENCE ACADEMY OF KAIST

LEADING THE FUTURE



SHAPING THE FUTURE OF  
SCIENCE AND TECHNOLOGY

**KSA!** A Community of Inquiry  
Opening the Future of Science and Technology



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# Leading the Future

KSA offers a pathway to the advancement of gifted education in Korea by discovering diverse scientific talents with potential, providing customized curriculum to support individual growth, and offering research-oriented education, global leadership development, and collaboration with KAIST.

## The First National Science Academy in Korea for the Gifted

- Best education with excellent teachers and students
- Pioneer in developing a specialized curriculum for science-gifted students, research-centered learning, convergence education, and globalization

## The Only Secondary School Supported by the Ministry of Science and ICT

- Stable budget and operation under the ministry's direct supervision
- Full support for nurturing key talents for the nation

## The Home of Future Scientists Growing with KAIST

(Korea Advanced Institute of Science and Technology)

- Affiliation with KAIST, world-class university in science & technology
- Systematic support for research and education in collaboration with KAIST





# Innovation

## Pioneering a path of self-discovery

Science talents from Korea are changing the world.

At KSA, science-gifted students are realizing the dreams of future scientists.

### Discover and Cultivate Young Scientists With High Potential for Growth

- A specialized system to identify exceptionally gifted students in science
- Enhanced admission processes, including both regular and Jangyoungsil tracks, to recruit a diverse array of talented students

### Development and Implementation of a Cutting-Edge, Student-Centered Curriculum

- A credit-based graduation system (the first among high schools in Korea)
- Pass/Fail grading system for mandatory first-year courses
- Accelerated learning options such as PT/AP, a variety of elective courses, and self-designed courses

### Research-Focused Education Aimed at Nurturing Innovative Science Talents

- Research-centered education in which students are exposed to research process step-by-step: R&E program (small group research project), graduation research, etc
- Research-centered academic advisory (RAA)
- Faculty with strong research experiences

### Advanced Education in Collaboration With KAIST

- Earning college credits through KSA AP (Advanced Placement) courses and KSA Honors' Program (HP)
- Graduation research under the guidance of KAIST professors through the KAIST High-school Research Program (HRP)
- Lectures taught directly by KAIST Professors





# Collaboration

An exploring community engaging with the world

*The dreams of future scientists are paving the way for a creative world.*

## Fostering Future-leading Scientific Talents Across Various Fields

- Developing world-class scientific talents with academic passion and exceptional research capabilities
- Cultivating international leaders with creativity and integrative thinking

## Internationalized Education for Nurturing Global Science Leaders

- Recruiting and educating outstanding talents from abroad
- Nurturing leadership and global mindset through a variety of international programs such as international collaborative research program, short-term overseas program, and student exchange program

## Pioneering Global Science Gifted Education.

- Achieving comprehensive education through collaboration with KAIST.
- Collaborating with domestic and international science schools to form networks.
- Advancing as a hub for global science gifted education.



# Coprosperity

Science leaders shaping the future of science and technology

## The Cradle of Joyful Future Scientists

- Nurturing individuals who possess self-awareness and empathy towards others
- Encouraging students to explore nature and discover global challenges
- Empowering students to envision and shape the future, and make contributions to the world

## Cultivating Genuine Talent Encompassing Intellect and Character

- Implementing various leadership programs aimed at nurturing character
- Fostering a sense of community through diverse experiences and activities

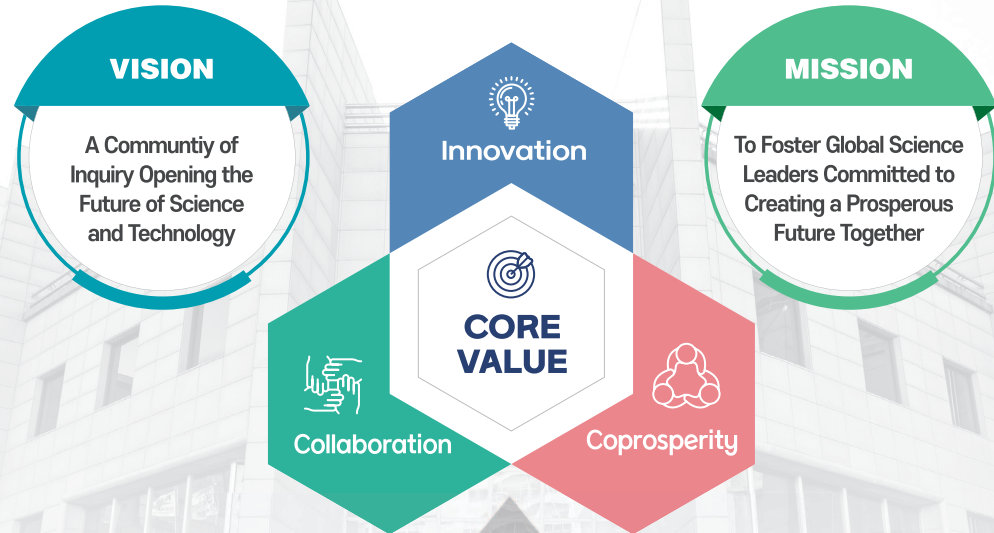
## Nurturing Talents Who Can Serve Humanity

- Creating great value through novel research and innovations
- Contributing to improved human life: richness, wellness, and safety





## The First National Science Academy in Korea for the Gifted



### MOTTO

#### Know Yourself

to understand oneself and empathize with others

#### Study Nature

to explore nature and discover global challenges

#### Answer the Future

to design the future and contribute to the world

### KEY STRATEGY

Discover and Nurture Young Talents with a Focus on Growth Potential

Provide Future-oriented, Self-directed, Research-centered Education

Lead the Future of Education in Science Gifted Education

## KSA, 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.

As of Mar. 2024

Students	Grade	Grade 10			Grade 11			Grade 12			Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
No. of Students		108	27	135	112	31	143	101	31	132	321	89	410
No. of Classes		12			12			12			36		

※ 30 international students included / 4 RAA classes operated separately

Faculty	Category	Principal	Vice Principal	Full-time Teachers		Dispatched by BMCOE*	Total
				Korean	Foreigner		
No. of persons		1	1	53	7	5	67

※ 100% of science and math teachers have Ph.D. degrees.

\* Busan Metropolitan City Office of Education (BMCOE)

Staff	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	3	1	1	6	6	10	62

(Unit : m<sup>2</sup>)

Facility	Site Area (59,180)			Building Area (36,635)								
	Buildings	Athletic Field	Roads	Main Bldg	Tamgu - Gwan	Hyeongseol - Gwan	Changjo - Gwan	Dream Design Center	Yeji - Gwan	Baegyung - 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

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 and science under the strong support from KAIST.

1991

3 The 1st Entrance Ceremony of Busan Science High School

2002

5 Designated and Converted to a Science-gifted Institute

2003

3 The 1st Entrance Ceremony as the Science-gifted Institute

2009

2 Affiliated to KAIST (Korea Science Academy of KAIST)

2013

11 10<sup>th</sup> Founding Anniversary as the First Science-gifted Institute in Korea

2024

3 Entrance Ceremony (133 students / 10 int'l students included)

2023

9 20<sup>th</sup> Anniversary of KSA Vision 2040 Ceremony

2023

6 Hosted KSA Science Fair 2023(KSASF 2023)

2021

4 Inauguration of the 10<sup>th</sup> Principal Dr. Jong Bae CHOI

2017

6 Hosted International Student Science Fair 2017 (ISSF 2017)





# 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)	<ul style="list-style-type: none"> <li>Natural Science (67 credits)</li> <li>Humanities (52 credits)</li> <li>Convergence (8 credits)</li> </ul>
Creative Research Activities (28 credits)	<ul style="list-style-type: none"> <li>Creative Basic Research (6 credits)</li> <li>Self - directed Small Group Research, and Domestic &amp; Int'l On-site Research (16 credits)</li> <li>Graduation Research (6 credits)</li> </ul>
Competency-based Leadership Activities (Over 270 hours)	<ul style="list-style-type: none"> <li>Career Development Activity (at least 60 hours)</li> <li>Cooperation Activity (at least 60 hours)</li> <li>Global Citizenship Activity (at least 60 hours)</li> </ul>

## 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 one 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 3<sup>rd</sup> 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, AI, quantum 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
1	Creative Basic Research	<ul style="list-style-type: none"> <li>Creative Design Activities</li> <li>Seminar on Basic Research Methodology</li> </ul>
2	Self - directed Small Group Research	<ul style="list-style-type: none"> <li>R&amp;E</li> <li>Domestic &amp; Int'l On-site Research</li> </ul>
3	Graduation Research	<ul style="list-style-type: none"> <li>Individual Research or KAIST HRP</li> </ul>

## 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 4<sup>th</sup> 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)

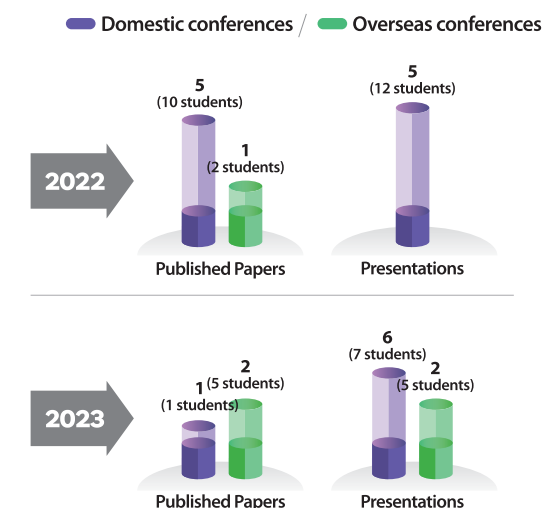
- A research-oriented system in which grade 10 to 12 students, under the guidance of an academic advisor, are assigned to a class to establish a mentor program between junior and senior students

## 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, SCIE 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 23 institutes in 13 countries**
- **International Class**
  - Outstanding foreign students selected from all over the world since 2010
  - International Students in 2024 : Total 31 students (10 students in 1<sup>st</sup> grade, 13 students in 2<sup>nd</sup> grade, 8 students in 3<sup>rd</sup> 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)**
  - An opportunity to improve and refine students' 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 (As of 2023)
- **Teacher Exchange Program (As of 2023)**

Division	Nation	Institutes	Date
Invitation	Thailand	Kamnoetvidya Science Academy	2023. 2.~ 4.
Online	Singapore	NUS High School of Mathematics and Science	2023. 3. 23.

## 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
- Domestic fair(even years) and International fair(odd years)

# 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.
- **KSA Orchestra Concert** : Creating a venue to harmonize with local community members
- **KSA Starlight Festival** : Providing students interested in science with opportunity to directly experience astronomical observations

## 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
- **LeeDaeGuen 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

(As of Feb. 2024)

#### Scholarships for Current Students

##### KSA Sponsor Scholarships

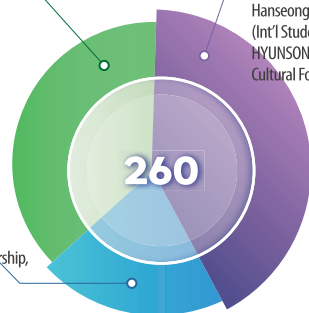
Sungwoo Hitech Co.,  
BN Group,  
Seun Steel Co.,  
DongHwa Entec,  
IJIN Construction Co.,LTD,  
BNK Busan Bank,  
NH Bank (Busan Headquarter)

##### Corporate Sponsor Scholarships

Hanseong Nobel Scholarships,  
Hanseong Nobel Scholarships  
(Int'l Students),  
HYUNSONG Educational &  
Cultural Foundation

Etc.

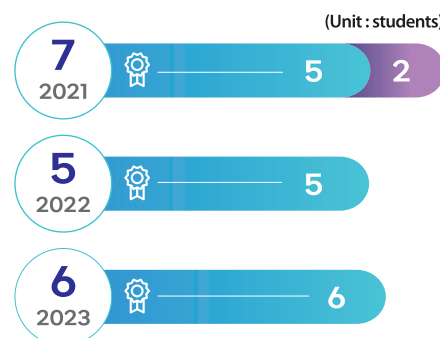
Sohyang Scholarships,  
Gifted education in science Scholarship,  
LeeDaeGuen Scholarship,  
KirmMinSeung Scholarship



#### Scholarships for Graduates

Presidential Science Scholarships

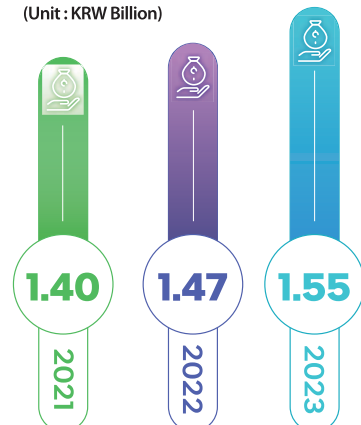
■ Domestic ■ Overseas



### KSA Development Fund

(As of Feb. 2024)

• KSA surpassed the fundraising milestone of KRW 1.5 Billion.  
(Unit : KRW Billion)



- Started as a fundraising campaign among faculty and staff (a total of KRW 160 million was donated)
- Donations from current students, graduates, and parents 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

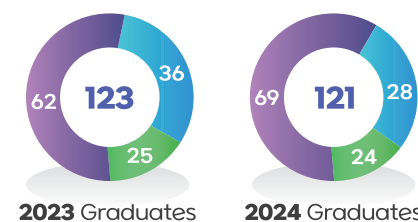


Students are admitted to universities through special admission process, with the majority furthering their education at KAIST, SNU, POSTECH, and other prestigious universities at home and abroad.

### Admissions to Universities

(As of Feb. 2024)

■ KAIST ■ Seoul National Univ. (Unit : students)  
■ POSTECH, UNIST, Yonsei Univ., Korea Univ., etc



※ 100% of students pursuing science and engineering majors in recent 10 years

※ Admission to overseas universities in 2024: To be confirmed after September 2024

### 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

• 121 students(2005~2023)

U.S.A.	85	(Harvard Univ./Princeton Univ./Stanford Univ., etc.)
U.K.	25	(Univ. of Oxford / Univ. of Cambridge Imperial College London, etc.)
Japan	6	(Univ. of Tokyo/Kyoto Univ./Osaka Univ., etc.)
Canada	2	(Univ. of Toronto)
Germany	1	(Jacobs Univ.)
China	1	(Chinese Univ. of Hong Kong)
New Zealand	1	(Univ. of Auckland)

## Admission



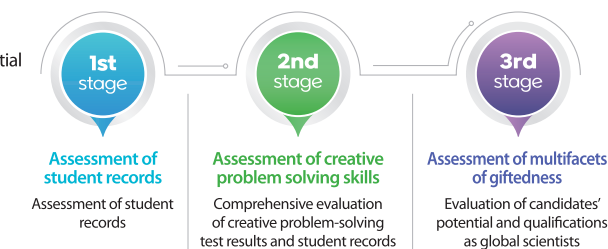
The school endeavors to recruit diverse talent through various admission categories : General, Jangyeongsil (domestic) and International.

### 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
- **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
- **International Track**
  - Used to recruit talented international students in mathematics and science
  - Evaluated based on evaluations, 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



• International Track

