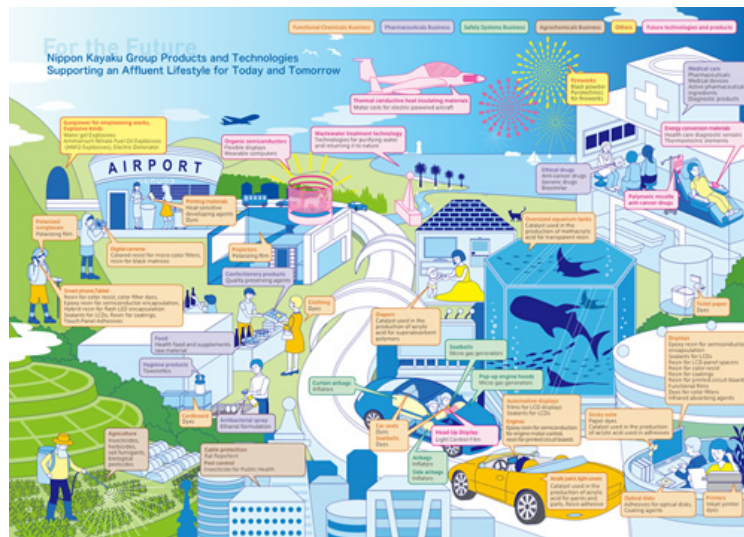




## CSR Activities Fulfilling Economic Responsibilities

### Current Nippon Kayaku Group Products and Future Technologies and Products Supporting an Affluent Lifestyle

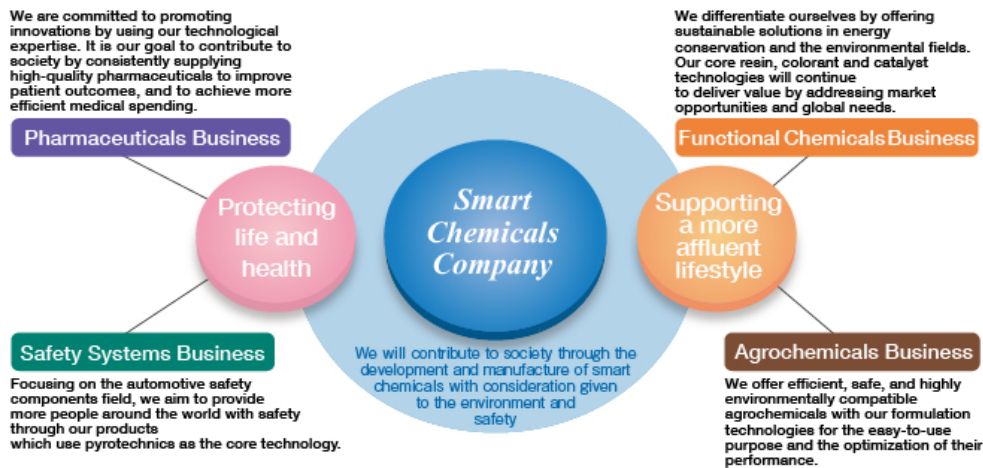
The Nippon Kayaku Group has adopted a corporate slogan called Global "sukima" ideas and is striving to develop Nippon Kayaku into a company that the world truly needs, by developing high value added products with unique technologies that stand out in niche markets and elsewhere.



[View larger image](#) 

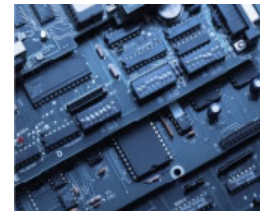
### The Nippon Kayaku Group's Businesses

This section will take a closer look at the 4 core businesses of the Nippon Kayaku Group as well as products that they developed with unique technologies that contribute to the betterment of society.



Continually delivering functional chemicals with less environmental impacts and that contribute to energy efficiency

The Functional Chemicals Business is developing and supplying functional chemicals with less environmental impacts and that contribute to energy efficiency. For example, our environmentally friendly NC-3000 series of epoxy resin is able to cure with a high degree of flame resistance without adding a flame retardant such as phosphorous or halogen. These adhesives are used for not only semiconductor encapsulation but also printed circuit boards and other fields. The high degree of quality and reduced environmental impact of these products has been proven, earning them the status of de facto standard in the marketplace today.



In addition, we are contributing to energy and resource savings through the development of high yield catalysts for making acrylic acid and methacrylic acid as well as colorants for industrial inkjet printers that do not produce waste water yet create vivid, solid colors thanks to our long-standing colorant synthesis technologies. These have earned us a strong reputation among our customers.

Functional Chemicals Business

Pharmaceuticals Business

We are committed to prompting innovations by using our technological expertise. It is our goal to contribute to society by consistently supplying high-quality pharmaceuticals to improve patient outcomes, and to achieve more efficient medical spending.

Nippon Kayaku is now working on the development of polymeric micelle anti-cancer drugs through a joint Multi-national Phase III Clinical Study. In addition, we are also participating in a joint Multi-national Phase III Clinical Study of monoclonal antibody biosimilar treatments for breast cancer as part of our proactive efforts to develop biosimilar treatments following the success of FILGRASTIM BS and INFLIXIMAB BS, which have already been launched.

We are committed to prompting innovations by using our technological expertise, including in the development of generic anti-cancer drugs. It is our goal to contribute to society by consistently supplying high-quality pharmaceuticals to improve patient outcomes, and to achieve more efficient medical spending.



MINK Web – an informative site targeting medical professionals developed by Nippon Kayaku

Pharmaceuticals Business

Safety Systems Business

With explosives safety technologies as our core competencies, we are providing safety to more people around the world mainly through our automotive safety components.

Automobile production in Southeast Asia is expected to see strong growth rates, second only to China in the world, and nearly 60% of the market is occupied by Japanese automakers. In 2011, ASEAN NCAP, safety evaluation standards for new vehicles, was established, with safety testing commencing in 2013. This has dramatically increased the use of automotive safety components in automobiles. Given this, the Safety Systems Group examined market entry in Southeast Asia, with these discussions culminating in the establishment of Kayaku Safety Systems Malaysia Sdn. Bhd. in December

2012. The air bag inflators and micro gas generators for seatbelt pretensioners made here are exported within ASEAN and to India, contributing to automotive safety in these areas.

[Safety Systems Business](#)



## Agrochemicals Business

**Providing agrochemicals with excellent effects, safety and environmental compatibility together with formulation technologies that make them easy to use and increase performance**

On February 15, 2016, the Agrochemicals Division launched spiracle-blocking insecticide Fuhmon<sup>®</sup>, which is ideal for Integrated Pest management (IPM) that does not rely only on chemical pesticides. This product offers four unique features: (1) it is made from polyglyceryl fatty acid ester which is used as food additive; (2) there are no limitations on the number of applications and it can be used even the day prior to harvesting vegetables; (3) it can protect plants from damage by spider mites, aphids, and whiteflies simultaneously; and (4) it is effective against insects that have become resistant to conventional chemical pesticides. Fuhmon<sup>®</sup> contributes greatly to protecting plants from various pests, which in turn contributes to the stable production of agricultural crops. Going forward, we will continue to contribute to agriculture while developing and supplying technologies and materials required by all aspects of this field.



[Agrochemicals Business](#)

## Research and Development

**Researching the Needs of Tomorrow: R&D for Organic Semiconductor Materials**

Electronics have drastically improved living standards since the 20th century. Today, electronics occupy an indispensable presence in many of the products we use every day, including computers, smartphones and medical equipment. One of the core components of these electronics is inorganic semiconductors.

Nippon Kayaku is researching and developing organic semiconductors as an alternative to inorganic semiconductors. Organic semiconductors can be used in a host of different products (products that bring our lives new and greater convenience) because they make it possible to make electronics softer. In addition, organic semiconductors can be printed, making the semiconductor manufacturing process more environmentally friendly and use less energy. Organic semiconductor materials are garnering much attention from academia and industry alike as a material that represents the key to the future of electronics.

Nippon Kayaku's organic semiconductor materials rate among the best in the world. We are also working closely with other leading research institutions in Japan and abroad to accelerate the commercialization of these technologies through our involvement in NEDO's consigned research project, the Japan Advanced Printed Electronics Technology Research Association (JAPER).

Going forward, Nippon Kayaku will seek to research new themes that capture the needs of tomorrow and to systematically develop businesses in the segment in order to make sustainable contributions to society.

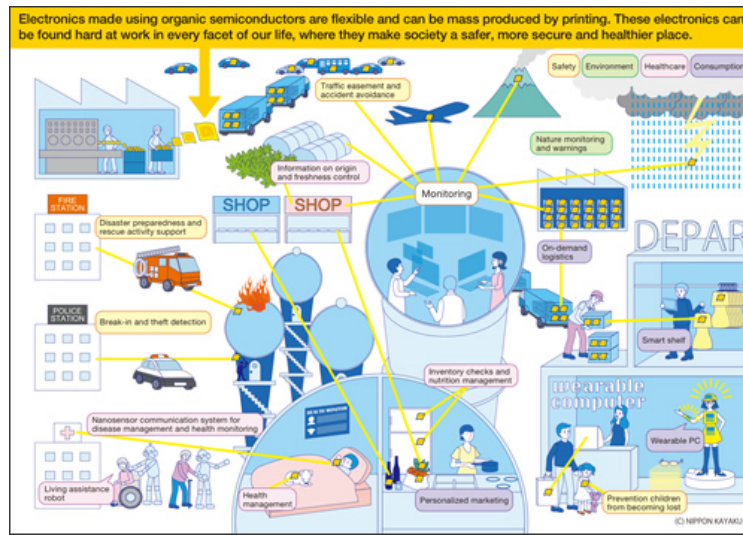
[Learn more about our research laboratories](#)



Inorganic semiconductor



Organic semiconductor



[View larger image](#)

## Globalization of research activities

Following the policy of Nippon Kayaku's global management, the Research and Development Group is in the process of building a global R&D structure inclusive of overseas Group companies. While promoting greater interaction among researchers working for overseas subsidiaries, the Research and Development Group is carrying out the following activities from the perspective of CSR.

### Hosting international internship students

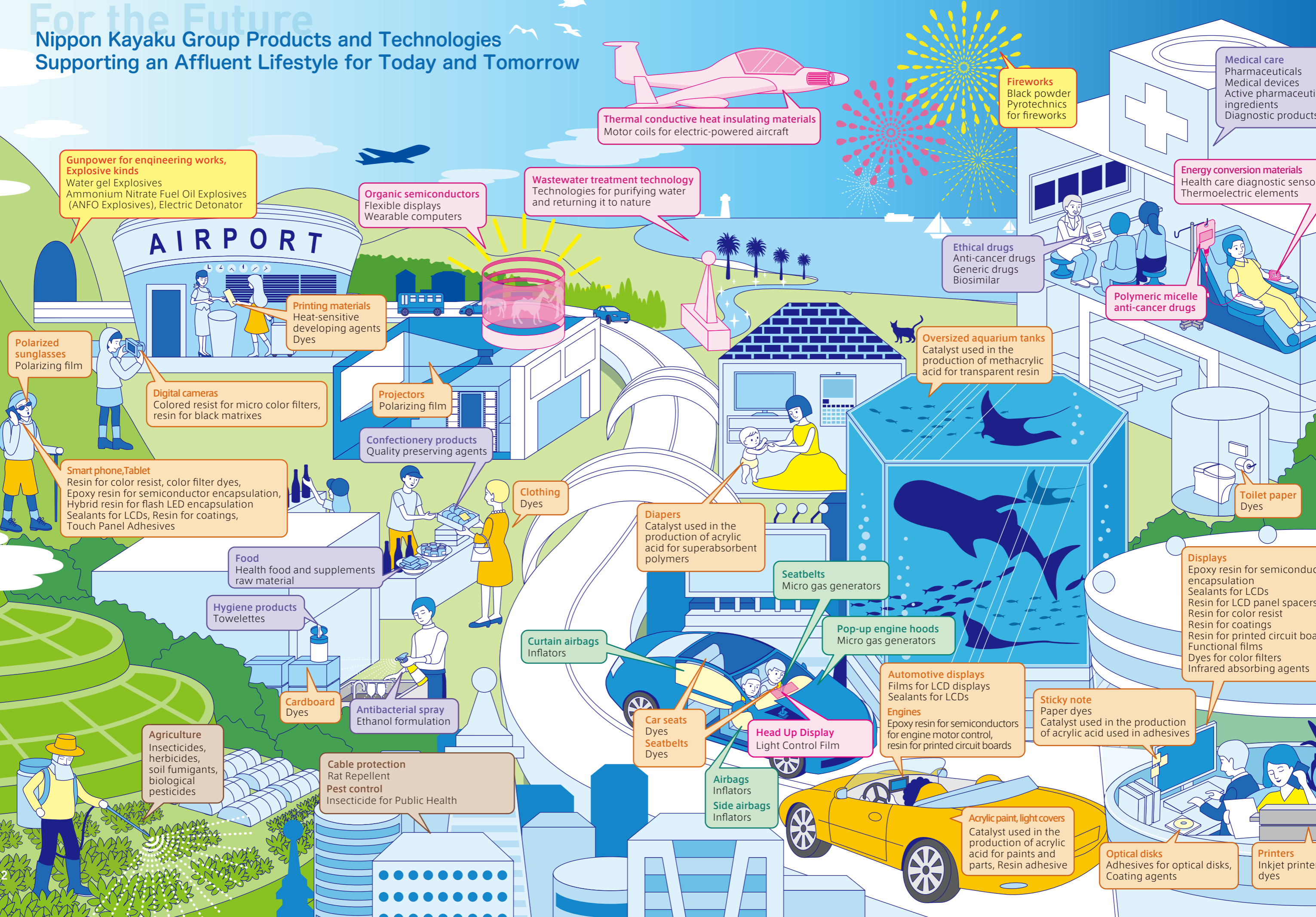
Nippon Kayaku hosts interns from both domestic and overseas universities. Interns engage in various activities at Nippon Kayaku's laboratories with a focus on research and development, while also learning about corporate activities and Japanese culture. At the same time our employees receive a boost in terms of motivation and stimulation by working together with these young interns. Going forward, through these internships, we will continue to globalize our corporate culture and contribute to international exchange as well as the education of overseas students.



### Joint collaboration with overseas research institutes

Nippon Kayaku actively engages in joint research with research institutes located outside of Japan. We will continue to incorporate outcomes of universities and research institutes in an effort to create a sustainable society using innovative technologies and materials.

# For the Future Nippon Kayaku Group Products and Technologies Supporting an Affluent Lifestyle for Today and Tomorrow



**Gunpower for engineering works, Explosive kinds**  
Water gel Explosives  
Ammonium Nitrate Fuel Oil Explosives (ANFO Explosives), Electric Detonator

**Thermal conductive heat insulating materials**  
Motor coils for electric-powered aircraft

**Fireworks**  
Black powder  
Pyrotechnics for fireworks

**Medical care**  
Pharmaceuticals  
Medical devices  
Active pharmaceutical ingredients  
Diagnostic products

**Energy conversion materials**  
Health care diagnostic sensors  
Thermoelectric elements

**Wastewater treatment technology**  
Technologies for purifying water and returning it to nature

**Organic semiconductors**  
Flexible displays  
Wearable computers

**Ethical drugs**  
Anti-cancer drugs  
Generic drugs  
Biosimilar

**Polymeric micelle anti-cancer drugs**

**Printing materials**  
Heat-sensitive developing agents  
Dyes

**Oversized aquarium tanks**  
Catalyst used in the production of methacrylic acid for transparent resin

**Polarized sunglasses**  
Polarizing film

**Digital cameras**  
Colored resist for micro color filters, resin for black matrixes

**Projectors**  
Polarizing film

**Confectionery products**  
Quality preserving agents

**Smart phone, Tablet**  
Resin for color resist, color filter dyes, Epoxy resin for semiconductor encapsulation, Hybrid resin for flash LED encapsulation, Sealants for LCDs, Resin for coatings, Touch Panel Adhesives

**Clothing**  
Dyes

**Diapers**  
Catalyst used in the production of acrylic acid for superabsorbent polymers

**Toilet paper**  
Dyes

**Food**  
Health food and supplements raw material

**Hygiene products**  
Towelettes

**Seatbelts**  
Micro gas generators

**Pop-up engine hoods**  
Micro gas generators

**Displays**  
Epoxy resin for semiconductor encapsulation  
Sealants for LCDs  
Resin for LCD panel spacers  
Resin for color resist  
Resin for coatings  
Resin for printed circuit boards  
Functional films  
Dyes for color filters  
Infrared absorbing agents

**Cardboard**  
Dyes

**Antibacterial spray**  
Ethanol formulation

**Curtain airbags**  
Inflators

**Automotive displays**  
Films for LCD displays  
Sealants for LCDs  
**Engines**  
Epoxy resin for semiconductors for engine motor control, resin for printed circuit boards

**Sticky note**  
Paper dyes  
Catalyst used in the production of acrylic acid used in adhesives

**Agriculture**  
Insecticides, herbicides, soil fumigants, biological pesticides

**Cable protection**  
Rat Repellent  
**Pest control**  
Insecticide for Public Health

**Car seats**  
Dyes  
**Seatbelts**  
Dyes

**Head Up Display**  
Light Control Film

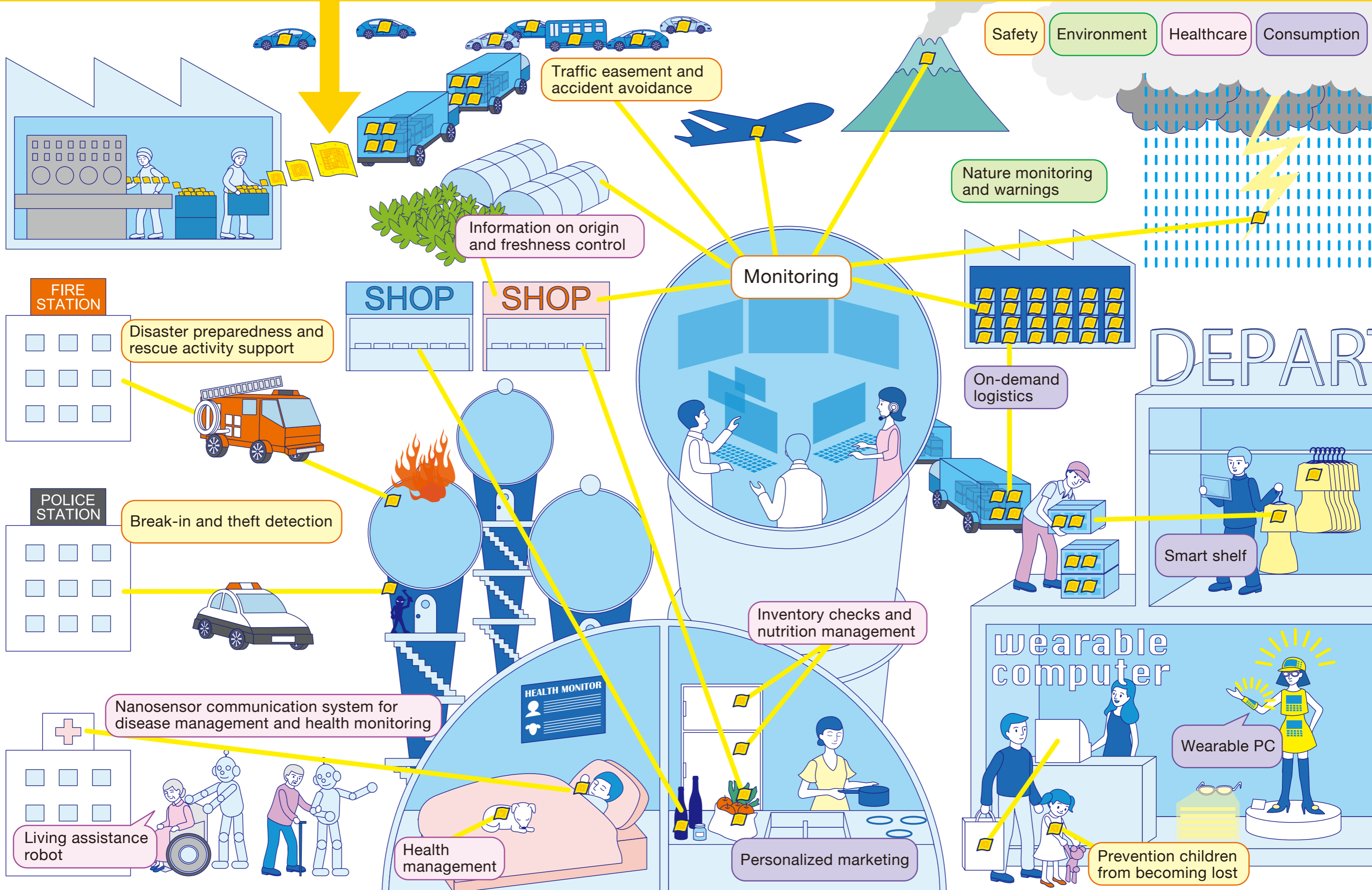
**Airbags**  
Inflators  
**Side airbags**  
Inflators

**Acrylic paint, light covers**  
Catalyst used in the production of acrylic acid for paints and parts, Resin adhesive

**Optical disks**  
Adhesives for optical disks, Coating agents

**Printers**  
Inkjet printer dyes

Electronics made using organic semiconductors are flexible and can be mass produced by printing. These electronics can be found hard at work in every facet of our life, where they make society a safer, more secure and healthier place.



Safety Environment Healthcare Consumption

DEPART

wearable computer

Wearable PC