An historical example...

What is it?
- July 20th, 1969
- One small step for man...
- Neil Armstrong, Apollo 11

What material made it?
- 3M Fluorel® fluoroelastomer
Our Vision

3M Technology Advancing Every Company
3M Products Enhancing Every Home
3M Innovation Improving Every Life
Enabling Customer Success: Our Five Market-Leading Businesses Groups

**Industrial**  
From purification to aerospace – changing how industry works

**Safety & Graphics**  
From protecting people and information to enhancing visual and design communication

**Health Care**  
From preventing infections to making smiles brighter

**Consumer**  
From simplifying life at home to keeping you organized at work

**Electronics & Energy**  
Enabling tomorrow’s lifestyle today with power, communications and electronics

- Sales: $30.9 B
- Net income: $4.7 B
- R&D investment $1.7 B
- International sales $19.7 B (64% of company total)
- Companies in 71 countries
- Sales in nearly 200 countries
- ~ 89,000 employees
- 200+ factories
- 55,000+ products
- 3,300+ patents issued in 2013
- 41,000+ issued and pending patents
Electronics and Energy Business - Electronics Portfolio

- Flexible Electronic Substrates
- Systems & Components

Electronic Solutions Division
- Substrates, sensors, components and systems to enhance and manage signals

Materials to enable semiconductor processes and consumer electronics devices

Optical Systems Division
- Technology and products to create exceptional visual experiences

Electronics Markets Materials Division
- Electronic Assembly Solutions
- Semiconductor Finishing
- Novec™ Fluids

- TV & Monitor
- Mobile Handheld (Smartphone & Tablets)
- Specialty Displays
Electronics and Energy Group - Energy and Infrastructure portfolio

- Electrical and Industrial Construction
- Utility
- OEM
- Maintenance and Repair
- Pipe Coatings
- Water
- Premises
- Wireline Access
- Wireless Access

Electrical Markets Division

Enabling the future grid, the next generation of electrical equipment, sustainable construction and infrastructure asset protection

Renewable Energy Division

Leading the convergence of energy conservation and renewable energy generation with differentiated film and material technologies

Communication Markets Division

Creating relevance in high-value segments of the Communications Industry and a link between Electronics and Energy

Electronics Markets Solutions Division

Leading in sustainable fluorochemical fluids and battery materials to enable the highest energy densities at competitive costs

- Energy Conservation – non-utility aftermarket segment
- Energy Generation – primarily an OEM solar infrastructure segment
- Li+ Battery Materials
- Novec™ Fluids
Leading Through Innovation

For More Than a Century

"Innovation is our biggest competitive advantage and the heart of 3M."

Inge Thulin, 2012
A History of Innovation

Established 1902
As our business grows, it becomes increasingly necessary to delegate responsibility and to encourage men and women to exercise their initiative.

“This requires considerable tolerance. Those men and women are going to want to do their jobs in their own way.”
McKnight Principles

“Mistakes will be made. But if a person is essentially right, the mistakes he or she makes are not as serious in the long run as the mistakes management will make if it undertakes to tell those in authority exactly how they must do their jobs.”

“Management that is destructively critical when mistakes are made kills initiative. And it is essential that we have many people with initiative if we are to continue to grow.”

William L. McKnight, 1948
Culture of Innovation

- 12,000+ technical employees worldwide
- 85 laboratories globally
- 45 Customer Technical Centers
- R&D at 5.6% of sales
- 46 established technology platforms
- Technical depth and breadth
- Bring multiple technologies to each customer
- Entrepreneurial culture
- Individual initiative ~ 15% of time
- Legacy of boundaryless culture
Corporate Recognition

**booz&co.**
Most Innovative Companies
3M Ranks 5th

**FORTUNE**
Most Admired Companies
3M Ranks 23rd

**BARRON’S**
Most Respected Companies
3M Ranks 7th

**3M**
- America’s Most Reputable Companies
  3M Ranks 25th
- Best Global Green Brands
  3M Ranks 24th
- Most Admired Companies
  3M Ranks 23rd
- 40 Best Companies for Leaders
  3M Ranks 23rd

**THOMSON REUTERS**
3-Time Top 100 Global Innovator

**Interbrand**
Best Global Green Brands
3M Ranks 24th

**Forbes INSTITUTE**
America’s Most Reputable Companies
3M Ranks 25th

**ENGLISH STAR**
10-Time ENERGY STAR® Sustained Excellence Award Winner

**ENERGY STAR SUSTAINED EXCELLENCE**

**HAYGROUP**
Best Companies for Leadership
3M Ranks 13th

**3M**

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Innovation Across the Globe
Diverse Solutions Meeting Local Needs

Technical capabilities around the globe identifying customer needs and developing solutions to meet both articulated and unarticulated needs.
3M’s Global Reach

71 Countries
85 Laboratories
45 CTCs

Just around the corner. All around the world.
A Connected Global Collaboration Community

1,200+ Technical Forum Events Globally

- 3M’s Annual Event – 3,300 participants
- The Spring Technology Symposium – 1,300 participants
- Carlton Awards Symposium – 500 participants
- Inventor Recognition Ceremony – 300 participants
- Circle of Technical Excellence & Innovation – 6,000 participants
- Virtual Technology Information Exchange – 1,700 participants
- Hundreds of Chapter Events – Sometimes as few as half dozen experts meeting on specialized topics such as dynamic molecular modeling

12,000+ member "grass roots" technical organization
3M 15% Culture

- It is a **culture/philosophy** not a time sheet measurement
- Enables employees to **explore** new technologies and/or new markets
  - Usually related to existing work
- Enables employees to **leverage** technical specialists
- Does not need management approval
- Teaches employees **leadership** and new skills
- **Diversity** in how employees utilize their 15% time

Many innovative 3M products were initially developed with 15% Time

- Display Protection Films
- APC™ PLUS Color Change Adhesive
- Post-it® Notes
- Transdermal Drug Delivery Adhesives
- 3M Scotchtint™ Auto Window Film
- Structured Abrasive Belts
- Multilayer Optical Film
- Post-it® Flag Highlighter
A Key Innovation Metric is NPVI

NPVI = New product vitality index (products introduced within the past five years, divided by total sales)

International new products now ~70% of total
Technology Drives Growth…

- 3M™ Brightness Enhancement Film
- 3M™ Confirm™ Laminate with Floating Image
- 3M™ Scotchshield™ Film 17 Solar Panel backsheet
- 3M™ Cubitron II™ Abrasives
- 3M™ Prestige Series Solar Films
- 3M™ Aluminum Conductor Composite Reinforced
- Scotch® Magic™ Tape
- 3M™ LED Light Bulb
46 Core Technology Platforms

Successful New Product Growth Builds on Uncommon Connections
Impact of 3M Platforms

- Pressure-Sensitive Adhesives: 75% of Company
- Filtration: 30% of Company
- Films: 40% of Company
- Microreplication: 45% of Company
- Non-wovens: 70% of Company

Innovation model encourages sharing and combination of platforms
3M Innovation Model

Technology Platforms
- Abrasives
- Adhesives
- Ceramics
- Electronics, Software
- Films
- Microreplication
- Nanotechnology
- Non-wovens
- Precision Coating
- Vapor Processing

Markets
- Architecture & Construction
- Consumer & Office
- Display
- Electronics
- Filtration
- Health Care
- Renewable Energy
- Safety & Security
- Telecoms and Utilities
- Water Infrastructure

Opportunity Drives Development and Utilization

Doing Things Only 3M Can Do
No-Flow Underfill with Nanosilica

Addressing Coefficient of thermal expansion (CTE) mismatch stress in chip assembly

- Solder: 20 ppm/°C
- Silicon: 2.5 ppm/°C
- FR-4 Board: 18 ppm/°C
- No-flow underfill: 60-70 ppm/°C
Nanostructured Fuel Cell Catalyst Materials

(a) Scanning electron micrograph at 10 000× taken in a plan view of a 3M nanostructure coated substrate showing the large areal number density of Pt coated whiskers (3-5 billion/cm²) and their uniaxial orientation.

(b) SEM at 45° viewing angle and 150 000× magnification. The Pt loading is 0.25 mg/cm². In both figures the scale is given by the eleven spaced dots and the numeric beneath the dotted line.
Composite Conductor (ACCR)

- Lighter
- Stronger
- Lower Thermal Expansion
ACCR Benefits

[Diagram showing height above ground and tower spacing with sag clearance values and current capacities.]
How does 3M deliver products that customers want?

Customer Inspired Innovation

3M Technology Platforms

New Product Introduction

Products Delivered to the Marketplace
Innovative NPI

- **transparent/conductive electrode & EMI shield**
- **submicron replication for microneedles and light management**
- **ACC**
- **auto-stereoscopic 3D films**
- **nanogold catalysts for personal protection**
- **Li ion battery components**
- **ultra vapor-barrier films for solar/display screens**
- **digital dentistry**
- **mirror films for solar**
- **high-performance nanoparticle composites**
- **membrane adsorbers (biotherapeutic purification)**
- **acoustic films**
- **renewable materials**
- **visual attention management**
- **high-performance nanoparticle composites**

3M Composite Conductor for High Performance Power Lines:
- Quick one for one replacement on existing towers
- 2X to 3X more power with same diameter cable
- Eliminates needs for new rights-of-way
- Long span crossings
3M Innovation is Planned, Purposeful and Global

3M Innovation is driven by a system of principles, practices and infrastructure that harness the chain reaction of new ideas.
Questions