

# Nanotechnology's Double-Edged Sword

<http://www.environmentaldefense.org/article.cfm?ContentID=4449>

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Reading Level Results	
<a href="http://juicystudio.com/services/readability.php#readresults">http://juicystudio.com/services/readability.php#readresults</a>	
Summary	Value
Total sentences	210
Total words	1862
Average words per Sentence	8.87
Words with 1 Syllable	1013
Words with 2 Syllables	335
Words with 3 Syllables	265
Words with 4 Syllables	249
Percentage of word with three or more syllables	27.60%
Average Syllables per Word	1.87
Gunning Fog Index	14.59
Flesch Reading Ease	39.99

## I. Introduction

- a. *Potential Benefits*
  - i. Energy
  - ii. IT
  - iii. Health Care
  - iv. Environmental Benefits
- b. *Nano*
  - i. Definition
  - ii. Scaling Perspective
  - iii. Material Property Differences on Nanoscale

[Research and discuss areas that will benefit from nanotechnology.](#)

[Activities to understand nanoscale.](#)

[Research materials that exhibit different properties.](#)

## II. “Looking Before We Leap”

- a. *Pros vs. Cons*
- b. *Advocating Funding for Safety and Precautionary Research*

[Read and discuss articles advocating and cautioning further nanotechnology development.](#)

## III. “Learning From History”

- a. *Advancements found to be damaging*
  - i. X-rays
  - ii. CFCs
  - iii. DDT
  - iv. Lead, Asbestos, PCB
- b. *Proactive approach*

????

#### IV. “A Big Future Promised in Tiny Building Blocks”

##### a. Carbon nanotubes

- i. Strong
- ii. Lung Damage

##### b. Moore’s Law

#### V. “Still Many Questions”

- a. Buckyballs
  - i. Electrical and Optical Applications
  - ii. Detrimental to water supplies

#### VI. “Risk Management Over Risky Business”

- a. Weighing benefits vs. costs

[What are Carbon Nanotubes?](#)

[What is Moore’s Law?](#)

[What is a Buckyball?](#)

#### VII. “Nanotechnology Today”

- a. Government and private investments
  - i. Advocating 10% to understanding implications
- b. Developing standards
  - i. Environmental Defense
  - ii. International Council on Nanotechnology
  - iii. American National Standards Institute
  - iv. American Society for Testing and Materials
  - v. Individual Companies
- c. Current Consumer Products
  - i. “Evolutionary” rather than “Revolutionary”
    1. Car bumpers
    2. Scratch resistant coatings on Sunglasses
    3. “Jumbotron” Lamps
    4. Sunscreens
    5. Stain resistant Pants

What is government doing to promote nanotechnology?  
Where is it being researched?  
What are the opportunities for careers in research and industry?  
What is being done to monitor the advancements?

How are current consumer products utilizing nanotechnology?

What is meant by “evolutionary rather than revolutionary”?

Research and discuss areas that will benefit from nanotechnology.

[Little Answers To World's Biggest Problems: Top 10 Nanotech Applications To Aid Poor](#)

1. Energy storage, production, and conversion
2. Agricultural productivity enhancement
3. Water treatment and remediation
4. Disease diagnosis and screening

[Stealth Particles To Target Tumors](#)

[Integration Of Nanotechnology With Biology And Medicine Will Result In Major Medical Advances](#)

5. Drug delivery systems
6. Food processing and storage
7. Air pollution and remediation
8. Construction
9. Health monitoring
10. Vector and pest detection and control

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Understanding the nanoscale

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Examples of materials that exhibit different properties at the nanoscale.

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Pro/Con Discussions.

[Nano-particle Research Will Benefit Inhaler-users](#)

[Tiny inhaled particles take easy route from nose to brain](#)

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Carbon Nanotubes

[Nanotubes Show Promise From TVs To Velcro](#)

[Modifications Render Carbon Nanotubes Nontoxic](#)

[Converging Technologies Can Improve Human Performance, Report Says](#)  
[Is It Ethical To Use Enhancement Technologies To Make Us Better Than Well?](#)  
[Ethics Of Boosting Brainpower Debated By Researchers](#)

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Moore's Law

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Buckyballs

[New Research Raises Questions About Buckyballs And The Environment](#)  
[Rice Finds 'On-Off Switch' For Buckyball Toxicity](#)

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