

# Design within the rules...

- Makes swimmer smaller, sleeker, faster
- Compresses body at key drag points
- Designed within 2008 Olympic constraints
- Worn by gold medalists of many countries

**Inventors: Engineers at Speedo**




# Step lively

- Computers in your shoes?
- Ideal for training
- Tracks distance, time and calories
- Customize your musical play lists for workouts
- Battery lasts 1000 hours

Inventors: Engineers at iPod/Apple and Nike


**How to Use the Nike + iPod Sport Kit**

**Step 1.**




Place the sensor in your left Nike+ shoe, in the built-in pocket beneath the insole. You can leave the sensor in your shoe even when you're not working out.

**Step 2.**



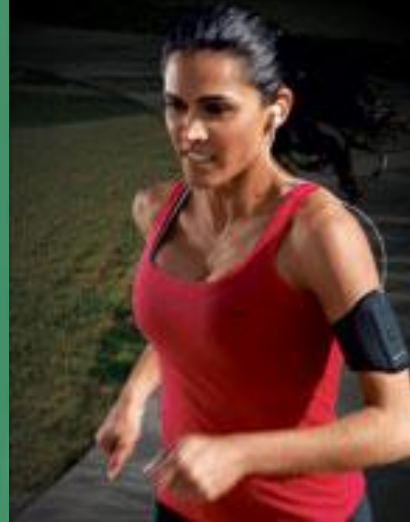
Attach the receiver to your iPod nano. The receiver fits snugly into the Dock connector, located on the bottom of your iPod nano next to the headphone jack.

**Step 3.**

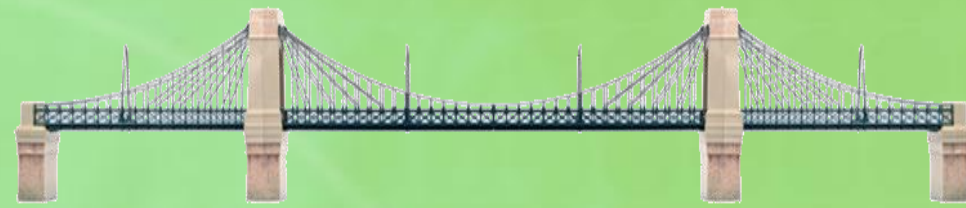


Hit the ground running with workout-based voice feedback, Nike Sport Music content, and an iPod nano that stays in tune with every step.

Song capacity is based on 4 minutes per song and 128-Kbps AAC encoding. 1,000 songs refers to 4GB model.  
The Nike + iPod Sport Kit will be available this summer for a suggested retail price of \$29 (US).







# Down to the wire (really!)

- Support threads are like a suspension bridge
- Flywire replaces all heavy structure; ~3 oz
- Inexpensive — may be manufactured in US

Inventors: Engineers at Nike



# Smooth Operator

- “Smart” prosthetic joint
- “Learns” an individual’s movements and self adjusts
- Reduces hip and back strain
- Control module: made of sensors, a computer chip and software

**Inventors: Biomedical engineers at Ossur and MIT**





# Not your everyday jeans...

- 2010 Winter Olympics snowboarding uniforms for US, China & Finland

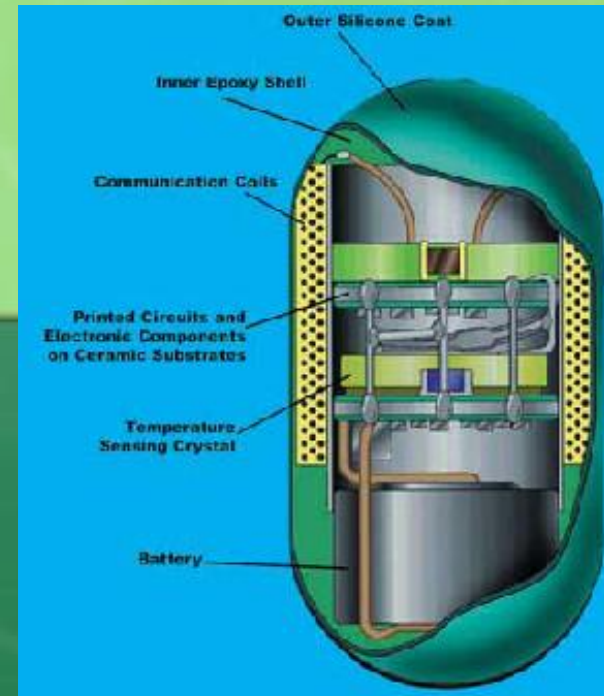
Look like plaid flannel and worn denim, but are:  
...next-generation fabrics made of waterproof membranes with breathable microporous holes

Inventors: GORE-TEX and Burton Boards



# Ingestible computers for athletes (really!)

- “Thermometer Pill” transmits athletes’ core body temperature and heart rate data
- Alerts to heat exhaustion
- Quartz crystal sensor & micro-battery wrapped in silicon



Inventors: Engineers at NASA and Johns Hopkins University

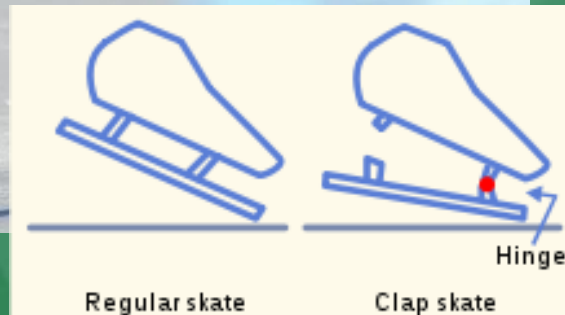


# Skiing armor

- Protects from high-speed wipeouts and 600mph gates
- Soft, thin and flexible material moves with body, but instantly hardens upon impact
- Spreads shock over surface area
- Uses shear thickening fluid reactive material



Inventors: Engineers at British firm d30 and Spyder



# Skater's edge

- “Clap skates”  
Back of blade hinged so stays on ice longer, evens out weight, legs generate more force

- Aerodynamic “swift suit” reduces air drag – Nike assures 1% faster times (close races!)
- Wind tunnel testing of suits and positions (arms behind backs, drafting, corner tilting)

**Inventors: Engineers at Nike (suits) and many others**



# “Smart” clothing

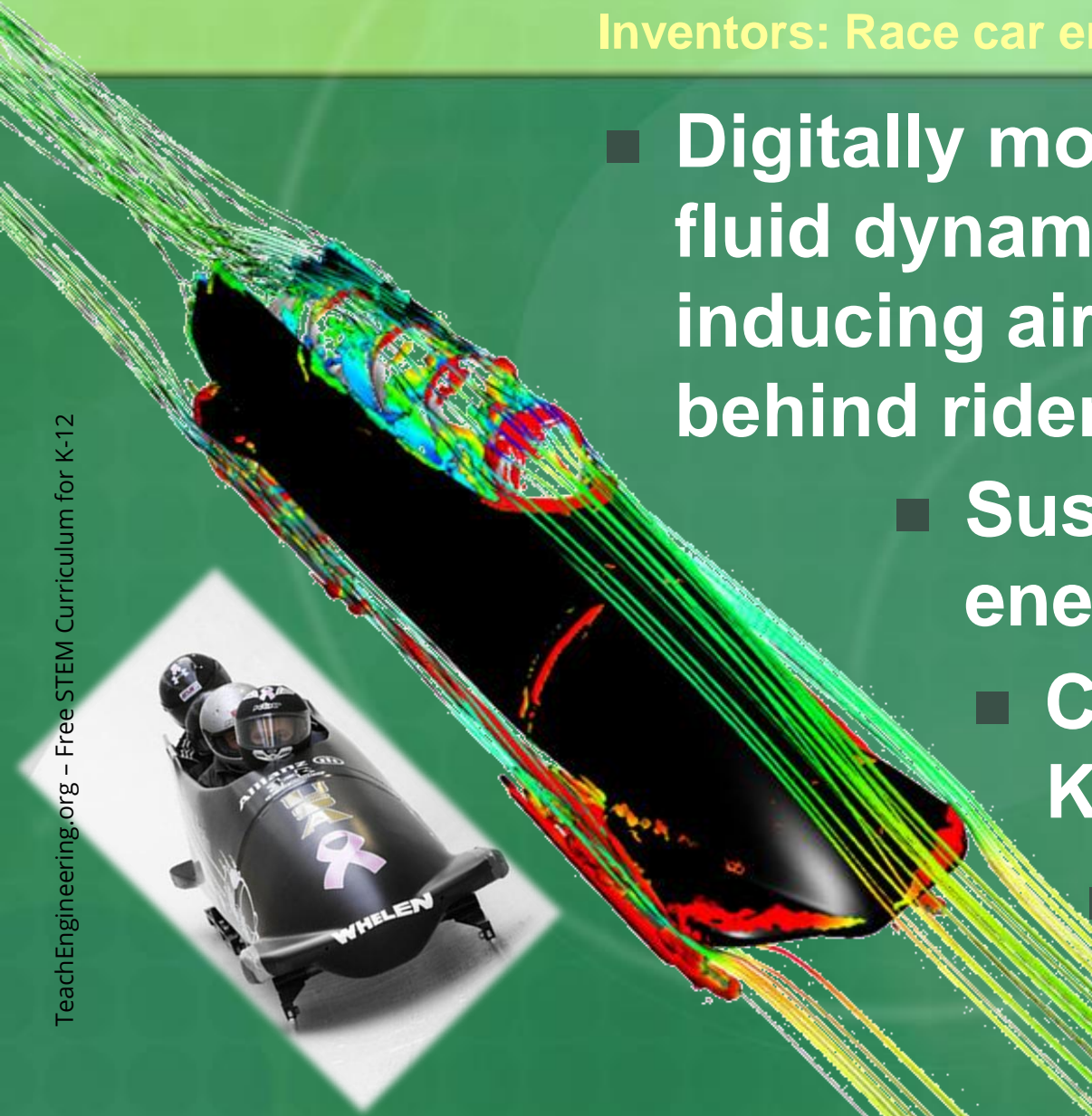
- Fabric with embedded microscopic sensors and wireless networks
- Remotely monitors athlete’s heart rate, body temperature, hydration and more
- Extends to patient and soldier applications: Records and transmits real-time biometrics — from blood pressure to bullet wounds



# Most aerodynamic sled ever

Inventors: Race car engineers at Exa Corporation

- Digitally modeled the bobsled's fluid dynamics to minimize drag-inducing air vortexes that form behind riders' heads
  - Suspension minimizes energy-draining vibration
    - Chassis of fiberglass, Kevlar and carbon fiber
    - Adjusts for weather, track conditions, metal fatigue





# Source information Feb 2010 (Winter Olympics)

- **Not your everyday denim...**

<http://www.tipsfromthelist.com/20513.html> and <http://www.zimbio.com/pictures/S45zd2-s7ns/Snowboard+Day+4/9FUJESpv0iR/Gretchen+Bleiler> and <http://www.gore-tex.com/remote/Satellite/content/community/press-release/1> and <http://insite.artinstitutes.edu/fabric-technology-works-to-enhance-performance-at-winter-olympics-19726.aspx>

- **Skiing armor**

<http://news.discovery.com/tech/winter-olympics-body-armor.html> and <http://news.discovery.com/tech/ten-techs-transforming-sports.html>

**Ingestible computers**

<http://news.discovery.com/tech/ten-techs-transforming-sports.html>

**Engineers give speed skaters edge**

<http://teachers.egfi-k12.org/engineers-give-speed-skaters-an-edge/> and <http://www.newsobserver.com/2010/02/17/344883/shani-davis-repeats-as-speedskating.html> and [http://en.wikipedia.org/wiki/Clap\\_skate](http://en.wikipedia.org/wiki/Clap_skate)

**Smart clothing – wearable computers**

<http://news.discovery.com/tech/ten-techs-transforming-sports.html>

**Bobsledding**

<http://www.cbsnews.com/stories/2010/02/22/tech/main6231849.shtml> and <http://www.popularmechanics.com/outdoors/sports/4345010.html?page=3>