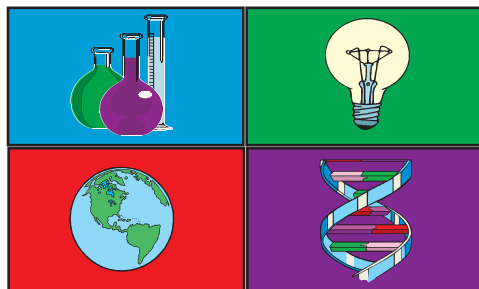


# Science TODAY™

## Student Edition

# USA TODAY

NO. 1 IN THE USA



## How the new Olympic swimsuit gives athletes an edge

### How the new Olympic swimsuit gives athletes an edge

Speedo's new bodysuit, the Fastskin FSII, helps swimmers increase their speed by reducing drag after a dive or turn. The different fabrics, designed to work like a shark's skin, anticipate change in the flow of water along the swimmer's body. Suits are gender and stroke specific and can reduce drag by up to 4% more than the ones worn in Sydney.

#### Fastskin

Mimics the rough shark denticles, tooth-like scales that reduce drag along key areas of the body. Fabric compresses the body to stop skin and muscle vibration. This saves energy and reduces drag at faster speeds.

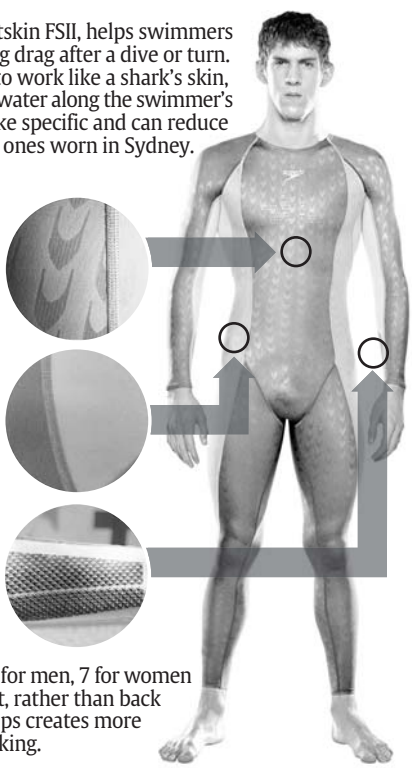
#### Flexskin

Smooth surface allows more freedom of motion and creates less drag at slower speeds.

#### Titanium silicon scales

When swimming, Flexskin caused athletes to lose their feel of the water. Silicon scales applied to the inner forearm let swimmers regain their grip.

- ▶ **13 different types of suits:** 6 for men, 7 for women
- ▶ **Backstroke suit:** Zips in front, rather than back
- ▶ **Breaststroke:** Fabric along hips creates more freedom of motion when kicking.



Source: Speedo

Reporting by April Umminger; graphic by Marcy E. Mullins, USA TODAY

### Focus Questions:

- By how many seconds has the world record improved in the 100M Freestyle?
- Based on your observation of the data, what do you predict the next world records will be in the 100M Freestyle?
- What is the percent change in the world records for the 100M Freestyle during the last few decades?

### Activity Overview:

Every time the Summer Olympic Games roll around, the World marvels at the performances of the greatest athletes in the World. Every four years, millions of people are awestruck by the establishing of new World and Olympic records. Race times, event heights and distances that we once thought were untouchable become history. The three major factors that contribute to the perpetual shattering of records are superior athletes, advanced training techniques and advances in the technology of the available equipment. In this activity, you will look at the potential impact of an improvement in the equipment used by World-class swimmers. You will also look at the improvement in the World records for the men and women in the 100 Meter Freestyle race. Is there a limit to how fast a man or woman can swim? What do you predict the new World records will be in the 100M Freestyle? Are there other factors that may affect the establishment of new records in swimming?

©COPYRIGHT 2004 USA TODAY,  
a division of Gannett Co., Inc.

This activity was created for use with  
Texas Instruments handheld technology.

## How the new Olympic swimsuit gives athletes an edge

### Procedure:

The table below shows the progression of the world records in the women's and men's 100 Meter Freestyle swimming race.

#### *Women's World Records*

#### *Men's World Records*

Year	Record (sec)	Year	Record (sec)
1958	61.2	1956	55.4
1960	60.2	1957	54.6
1962	59.5	1961	53.6
1964	58.9	1964	52.9
1972	58.5	1967	52.6
1973	57.54	1970	51.94
1975	56.22	1972	51.22
1978	55.41	1975	50.59
1980	54.79	1976	49.44
1986	54.73	1981	49.36
1992	54.48	1985	48.95
1994	54.01	1988	48.42
2000	53.77	1994	48.21
2004	53.66	2000	47.84

### Step 1

In L1 of the graphing calculator, enter the "Years" for the women's world records. Enter the corresponding record times in L2.

### Step 2

In L3, enter the "Years" for the men's world records, and enter the corresponding times in L4.

### Step 3

Turn on STAT PLOT 1 and graph the progression of the women's world record from 1958 to 2004. Make sure the other two STAT PLOTS are turned OFF.

### Step 4

Now go back to the STAT PLOTS and turn on PLOT 2 and graph the progression of the men's world record from 1956 to 2000. The reason that the men's record "ends" at 2000 is that the record has not been broken since then.

### Data Source:

Speedo

### Materials:

- TI-83 Plus family or TI-84 Plus family
- TI-Navigator system, if available

## How the new Olympic swimsuit gives athletes an edge

### Assessment and Evaluation:

1. By how many seconds has the women's world record improved since 1958?

---

2. By how many seconds has the men's world record improved since 1956?

---

3. Based on the data, what do you predict will be the next women's world record?

---

4. Based on the data, what do you predict will be the next men's world record?

---

5. From 1958 to 1978, what was the percent change in the women's world record? What has been the percent change from 1978 to 2004?

---

---

6. What was the percent change in the men's world record from 1956 to 1976? What has been the percent change from 1976 to present?

---

---

7. What difference do you notice from the early 1970s to present? Explain the difference.

---

---

### Student Notes: