

Preparing Students to Thrive in 21st Century America

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Plan for Session

- Changes in the Economy
- Responding to Questions from Community Members

Resource

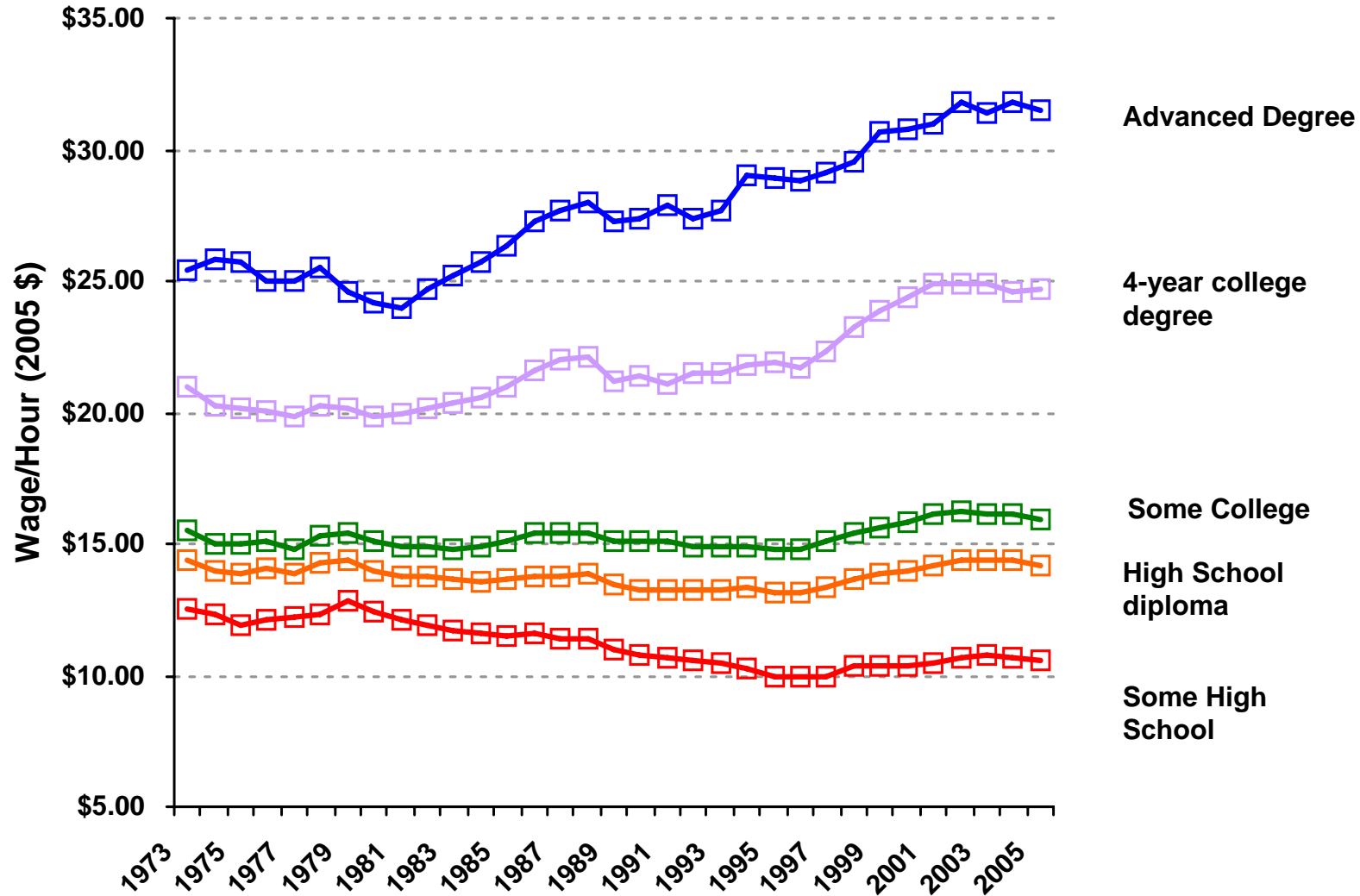
Frank Levy and Richard J. Murnane



THE NEW DIVISION OF LABOR

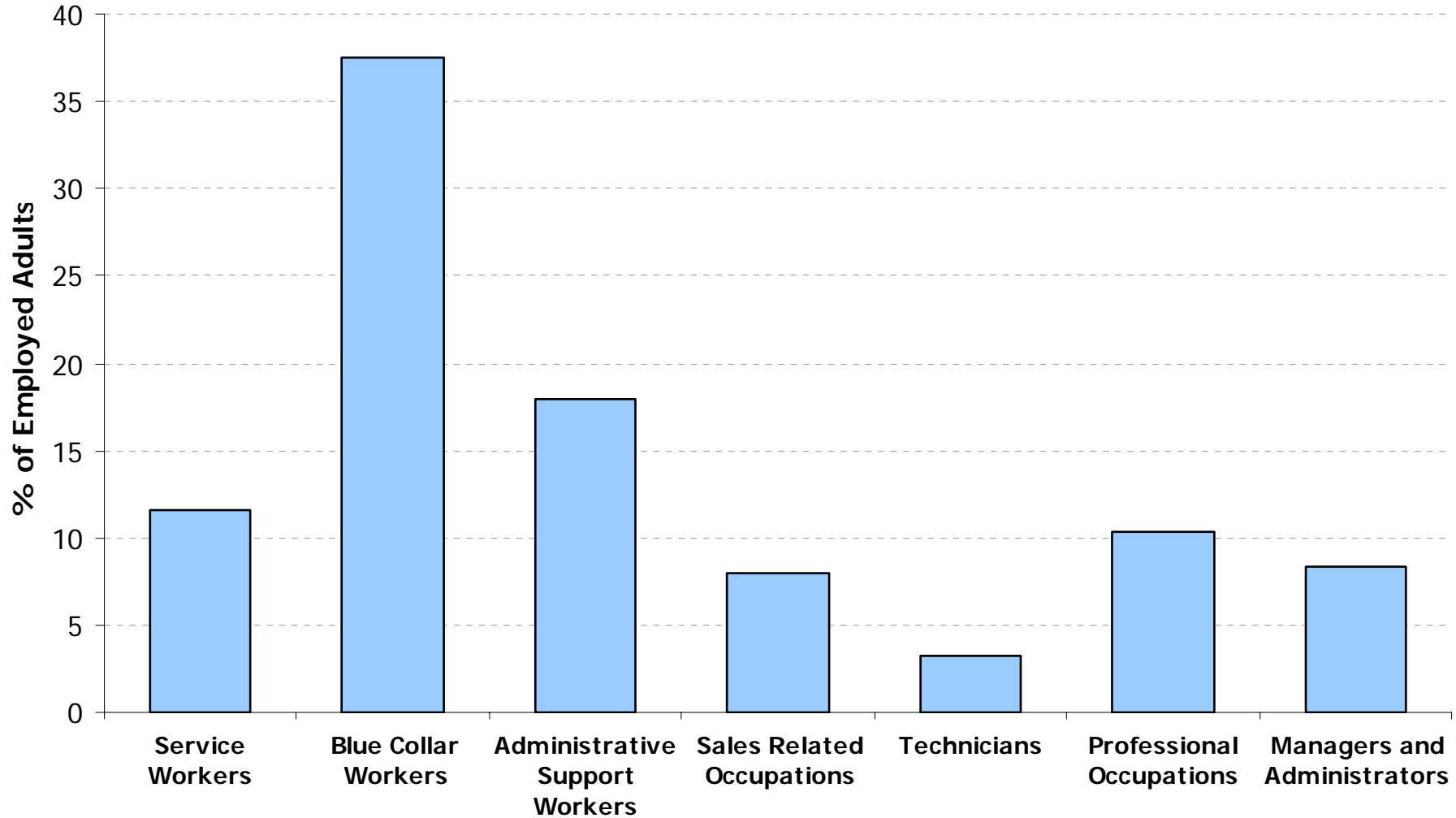
**How Computers are Creating
the Next Job Market**

Real hourly wage by highest educational attainment for U.S. workers: 1973-2005 (2005 dollars)



The 1969 Adult Occupational Distribution

Groups arrayed from lowest average earnings on left to highest average earnings on right



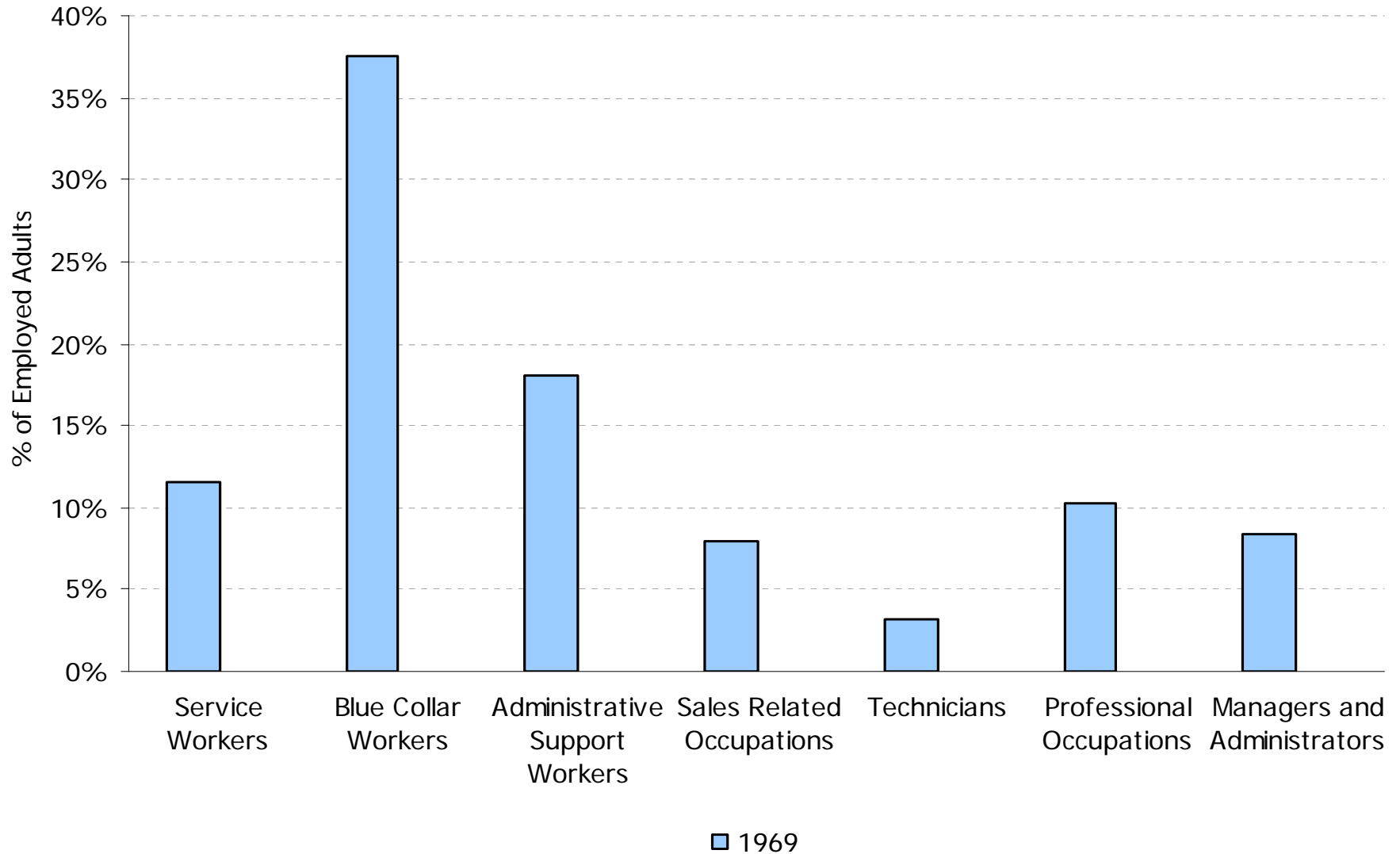
Tasks Computers Do Well

- Computers are best at performing task that can be described in If-Then-Do rules (*Rules Based Logic*).
- Examples include:
 - Filing and bookkeeping
 - Order processing
 - Securities trading
 - Some assembly line work
- **Summary: Computers are good at routine-cognitive tasks and routine-manual tasks**

Types of Tasks Computers Do Not Well

- Tasks that cannot be described well as a series of if-then-do steps because:
 - We don't know how to do many of the things we do (Polyani).
 - Not all contingencies can be predicted ahead of time.
 - We learn to define the task and accomplish it through social interactions.
- **Summary: Computers are not good at non-routine manual tasks and non-routine cognitive tasks.**

The Adult Occupational Distribution: 1969

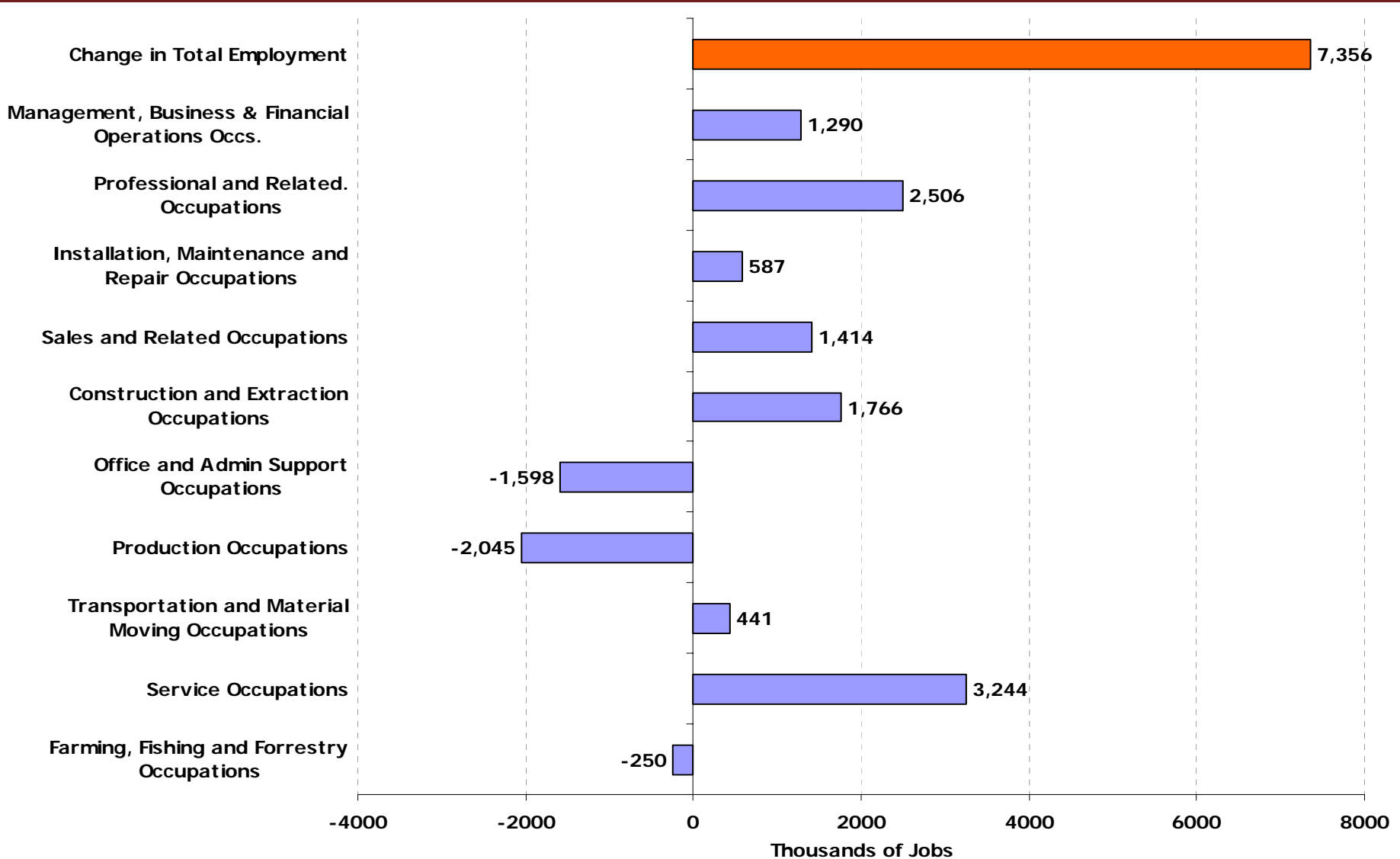


The Adult Occupational Distribution: 1969 and 1999



Occupational Change May 2000-May 2006

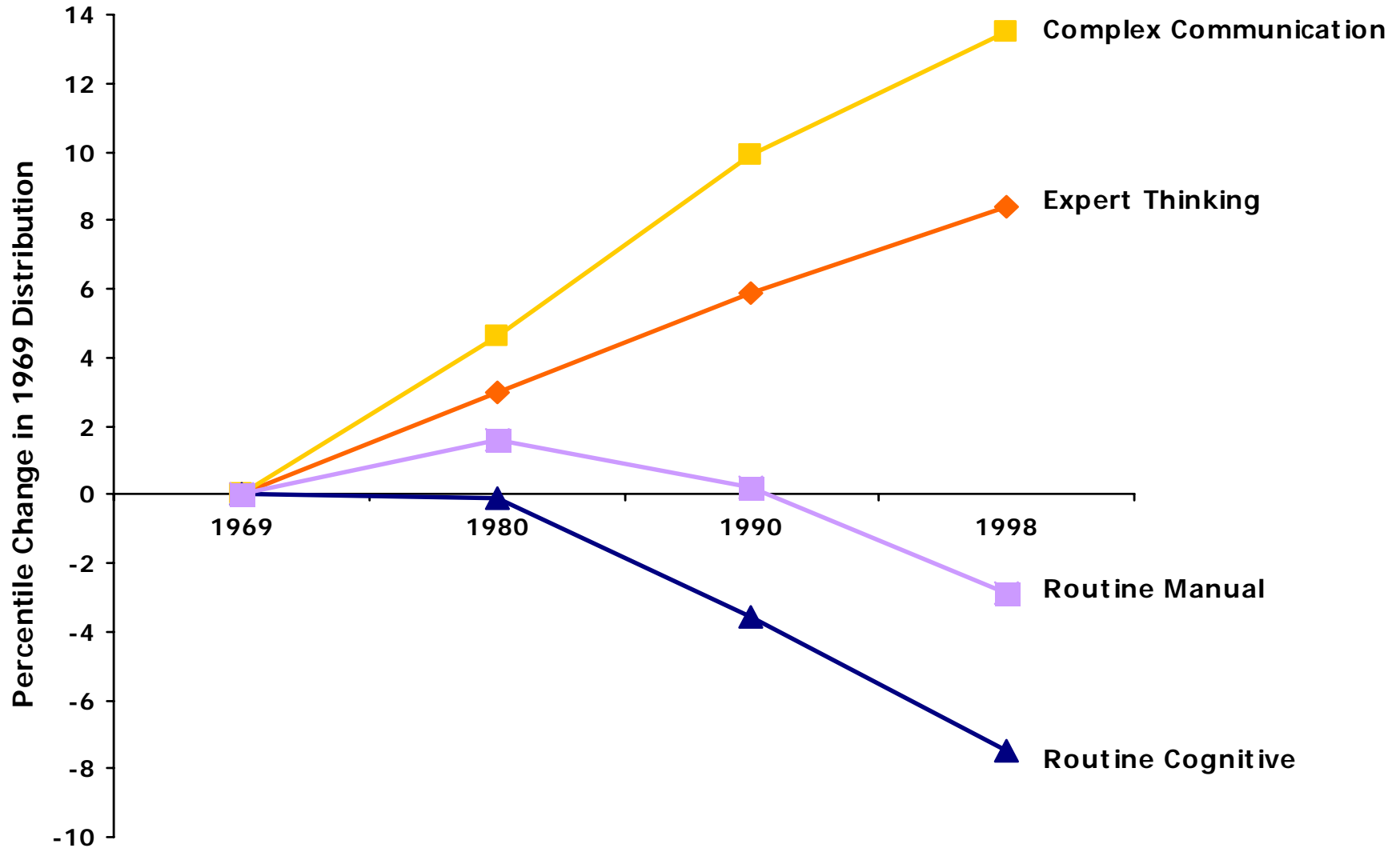
Change in 1000's of persons



Four Kinds of Workplace Tasks

- Routine Cognitive (filing, bookkeeping)
- Routine Manual (assembly line work)
- Expert Thinking (identifying and solving new problems)
- Complex Communication (eliciting critical information and conveying a convincing interpretation of it to others)

Economy-Wide Measures of Routine and Non-Routine Task Input: 1969-1998 (1969=0)



Key Elements of Expert Thinking

- A great deal of well organized knowledge about the problem (not memorized facts, but well understood relationships).
- Skill at pattern recognition
- Initiative
- Metacognition

Key elements of complex communication

- Observing and listening.
- Eliciting critical information.
- Interpreting the information.
- Conveying the interpretation to others.

The Secretary's Job

U.S. Department of Labor Occupational Outlook

■ 1970 description of a secretary's job:

- "Secretaries relieve their employers of routine duties so they can work on more important matters. Although most secretaries type, take shorthand, and deal with callers, the time spent on these duties varies in different types of organizations."

■ 2000 description of a secretary's job:

- "As technology continues to expand in offices across the Nation, the role of the secretary has greatly evolved. **Office automation and organizational restructuring have led secretaries to assume a wide range of new responsibilities once reserved for managerial and professional staff. Many secretaries now provide training and orientation to new staff, conduct research on the Internet, and learn to operate new office technologies.** In the midst of these changes, however, their core responsibilities have remained much the same – performing and coordinating an office's administrative activities and ensuring that information is disseminated to staff and clients."

Implications for Education

The **Three R's** are not less important, but they need to be tools for **knowledge acquisition and communication.**

Implications for Education

Expert Thinking and Complex Communication are not new subjects to add to the **curriculum**. They should be at the center of **instruction** in every one of the **existing subjects**.

Implications for Education

Computer skills should be taught as tools to use in bringing expert thinking and complex communication to bear in mastering core subjects (math, ELA, science, and social studies).

What was the date of battle of the Spanish Armada?

Student 1: 1588.

Q. How do you know this?

It was one of the dates I memorized for the exam.

Q. Why is the event important?

I don't know.

Student 2: It must have been around 1590.

Q. How do you know this?

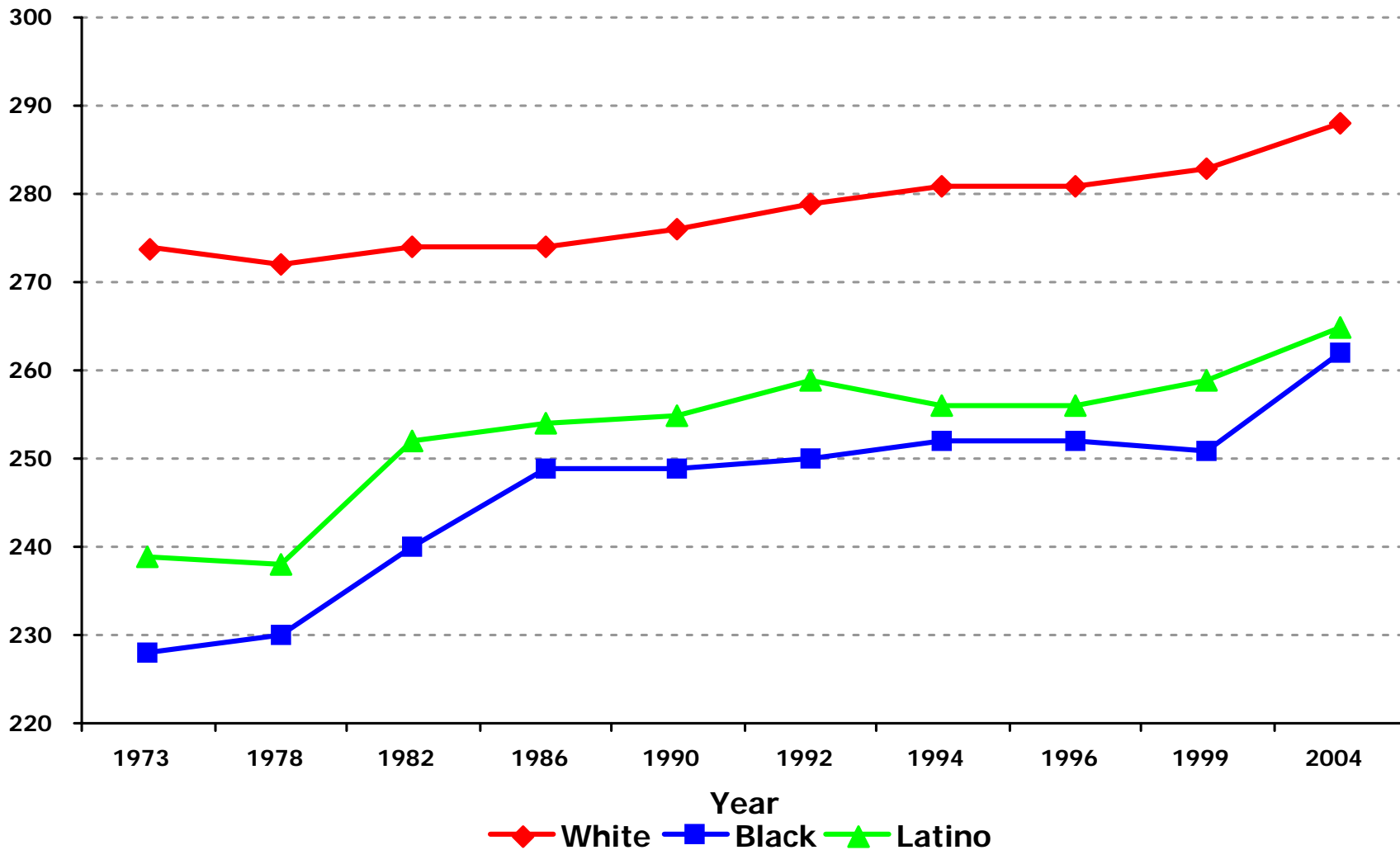
I know the English began to settle in Virginia just after 1600, although I'm not sure of the exact date. They wouldn't have dared start overseas explorations if Spain still had control of the seas. It would have taken a little while to get expeditions organized, so England must have gained naval supremacy somewhere in the late 1500's.

Q. Why is the event important?

It marks a turning point in the relative importance of England and Spain as European powers and colonizers of the New World.

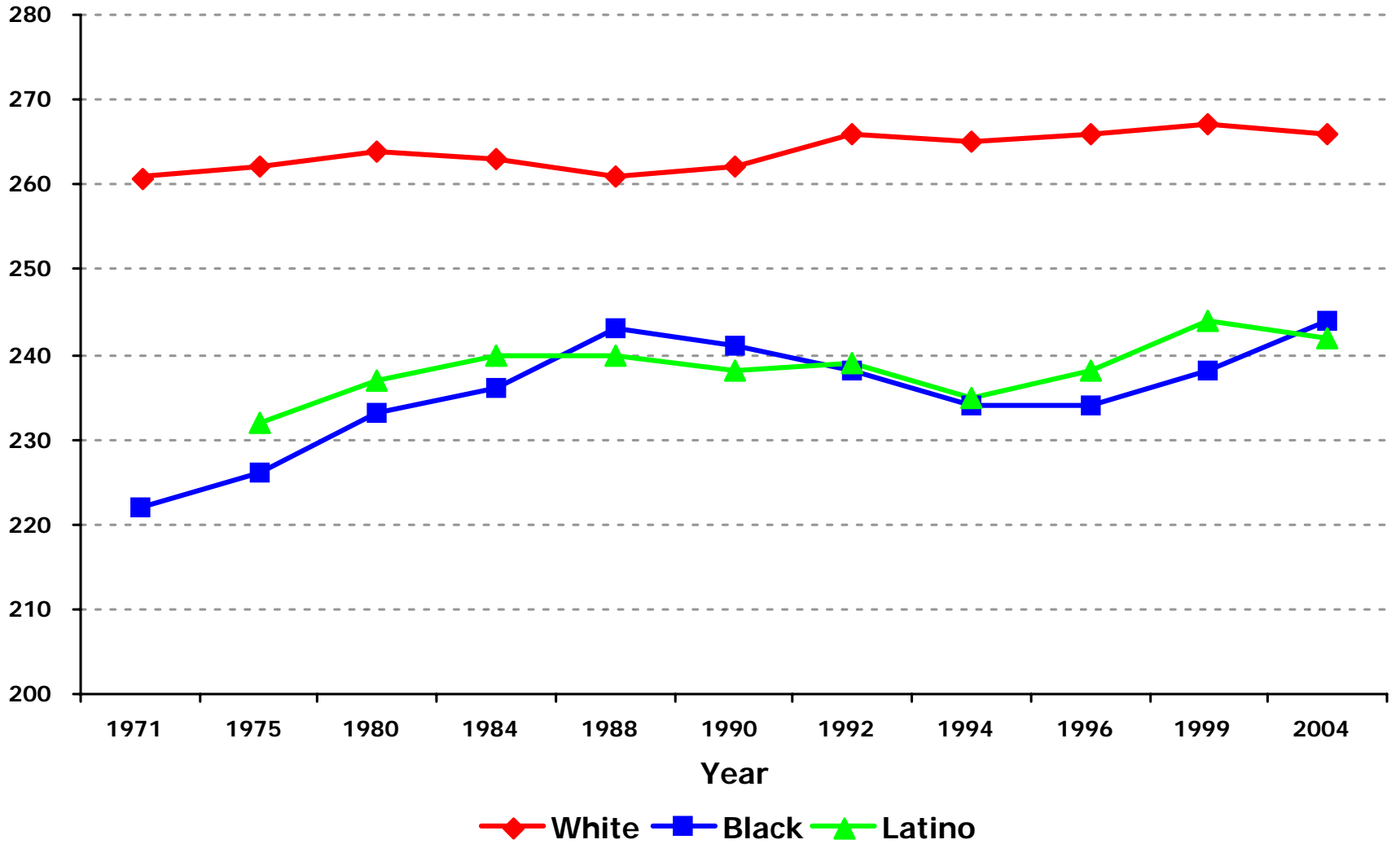
NAEP Test Score Trends in Mathematics

National Averages for 13 Year Olds (8th Grade)

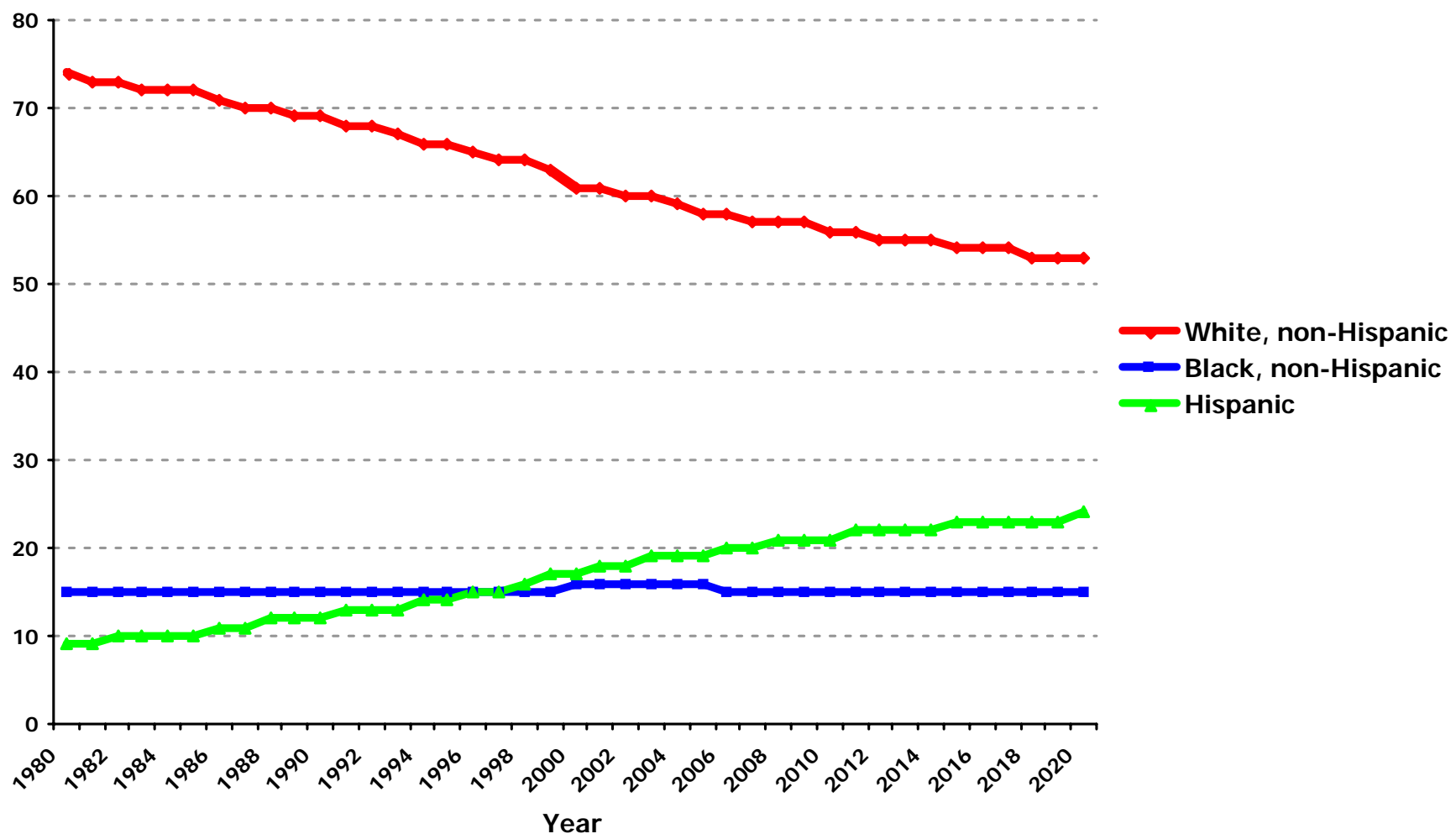


NAEP Test Score Trends in Reading

National Averages for 13 Year Olds (8th Grade)



Racial and Ethnic Composition of American Children from 1980-2020 (projected)



Question from a parent who works at Price Chopper

- I grew up in this community and went to public schools here in the early 1970s. Back then, the guidance counselors were always telling us we needed to develop the skills for succeeding in the workplace. When I was a junior, I was encouraged to enroll in the vocational program in order to prepare for a career in the booming production sector. Ten years later, all the production jobs left town and I was left without a job. Now, I work at Price Chopper and am struggling to make ends meet. Why should my kids be involved in Tech Apprentice programs like BATEC is pushing? Aren't those jobs just going to disappear in 10 years?

Question from the President of the League of Women

Voters

- My concern is that students learn to be good Americans: to understand our heritage and the importance of rule of law and of improving our society. What does teaching children expert thinking and complex communication have to do with their becoming good Americans? I, for one, don't think the goal of education is *just* to prepare students for jobs!

Question from the owner of Saniserv, a large firm that does janitorial work for area businesses

- My business depends on having a supply of 500 workers who are willing to do janitorial work for \$10 per hour. What are the consequences for my business of your attempts to improve the skills of the students graduating from our city's public schools?

Question From the Assistant Superintendent for Curriculum and Instruction

- I am particularly concerned about our district's math teachers. All of our professional development efforts have been directed at preparing teachers to cover the content tested on the mandatory state math test with the sole aim of improving our poor test scores. What will the requisite mathematics professional development have to look like in order to prepare teachers to teach expert thinking and complex communication skills? Do you feel that these efforts will translate into measurable improvements on the state math test?

Question from the Mayor

- Over the last seven years, the number of jobs in the U.S. economy has increased by more than seven million. Worcester's problem is that it has not shared in this growth. Isn't what we need a federal grant to jump-start economic development rather than changes in our education system?

Summing Up

1. There is a pressing need to improve American education
 - a. The reason is not that education is worse than it was 35 years ago.
 - b. The reason is that as a result of economic and demographic changes, the education that was good enough 35 years ago is not good enough today.
2. Preparing students to thrive in the 21st Century means helping them to become proficient at Expert Thinking and Complex Communication.
3. Improving High Schools Requires that the Adults become more Proficient in working together at Expert Thinking and Complex Communication.