

The CHIPS Act, STEM Education, and National Defense Authorization Act (NDAA) June 2024

James Brown

Executive Director, STEM Education Coalition



Universal Technical Institute, Inc.

ExxonMobil

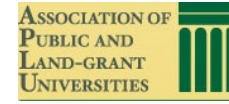
ITHACA COLLEGE



HANDS-ON SCIENCE PARTNERSHIP



BHEF BUSINESS-HIGHER EDUCATION FORUM



ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS



TEXAS INSTRUMENTS

FESTO



IEEE USA



STEM EDUCATION COALITION

Science Technology Engineering Mathematics



AACTE AMERICAN ASSOCIATION OF COLLEGES FOR TEACHER EDUCATION



SASA Student Association for STEM Advocacy

NSTA National Science Teachers Association

naaee North American Association for Environmental Education

ASA AMERICAN STATISTICAL ASSOCIATION



ASBMB American Society for Biochemistry and Molecular Biology

Afterschool Alliance



PROJECT LEAD THE WAY PLTW



ASME SETTING THE STANDARD

NATIONAL INSTRUMENTS

NSBE NATIONAL SOCIETY OF BLACK ENGINEERS

swe Society of Women Engineers

Battelle The Business of Innovation

Channel One News

EDC Learning transforms lives.

RSA CONFERENCE



NCSSS National Consortium of Secondary STEM Schools

Three Key Discussions Today

- The coming election and major issue trends
- Overview of the CHIPS Act
- National Defense Authorization Act and STEM

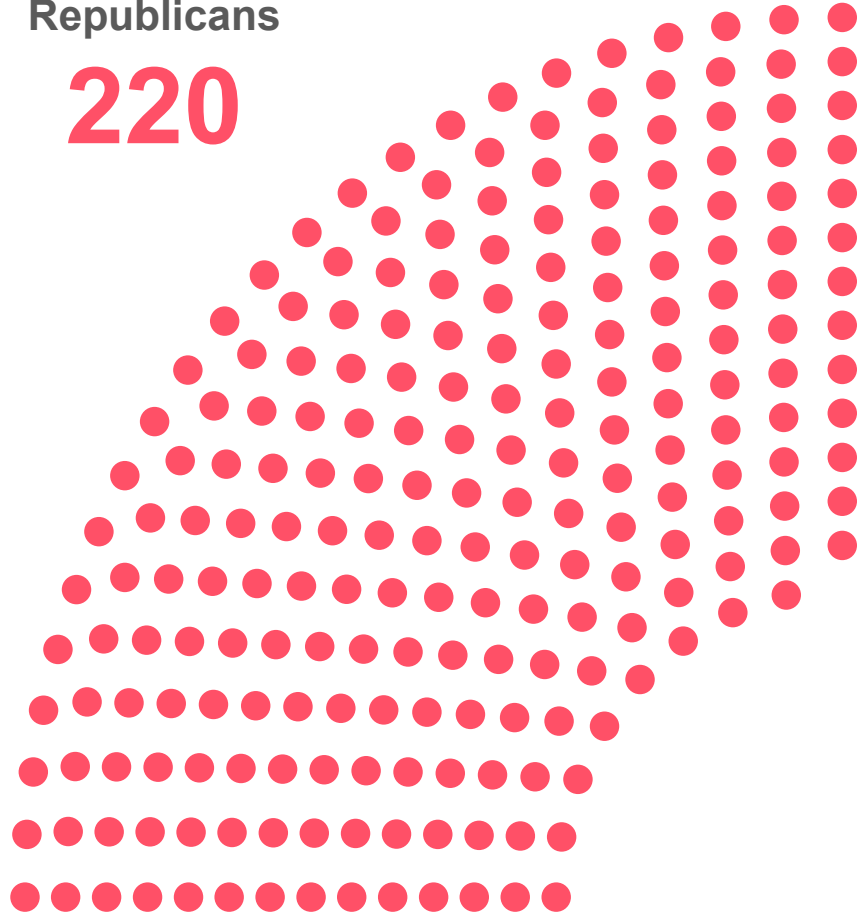
Welcome to General Election Season



House Balance of Power for the 118th Congress

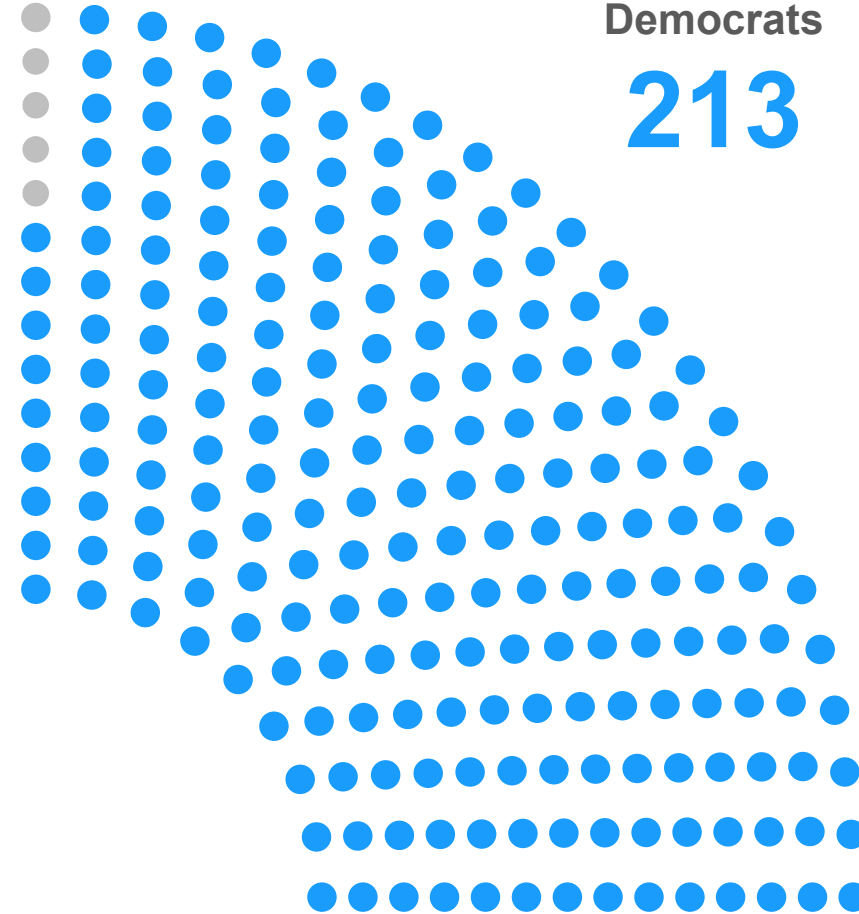
Republicans

220



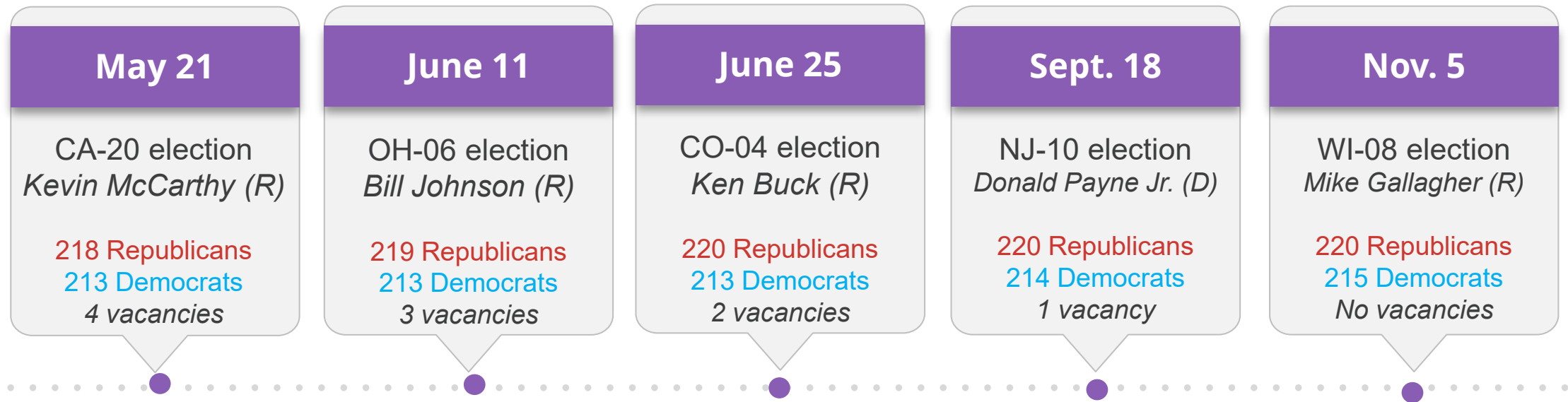
Democrats

213



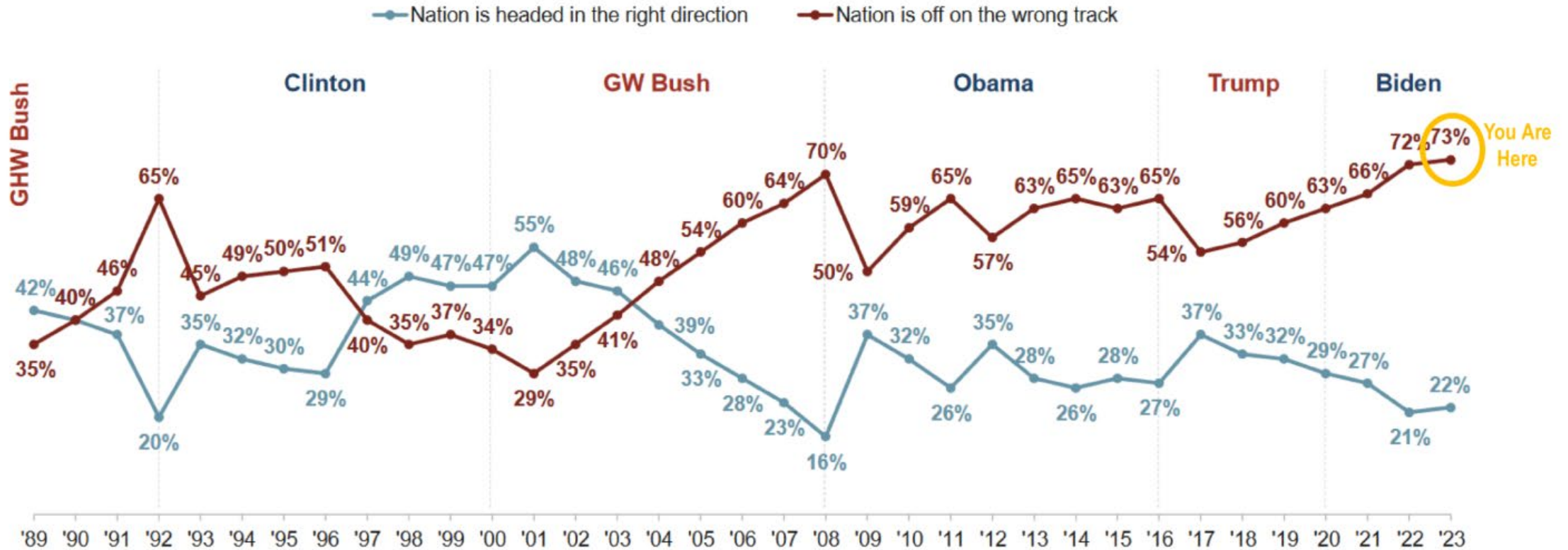
- Notes: As of May 8. Grey circles represent CA-20 seat vacated Dec. 31, 2023, by Kevin McCarthy (R); OH-06 seat vacated Jan. 21 by Bill Johnson (R); CO-04 seat vacated March 22 by Ken Buck (R), WI-08 seat vacated April 24 by Mike Gallagher (R-Wis.), and NJ-10 vacancy caused by April 24 death of Donald Payne Jr. (D).

Departures, Special Elections Affect Current Majority

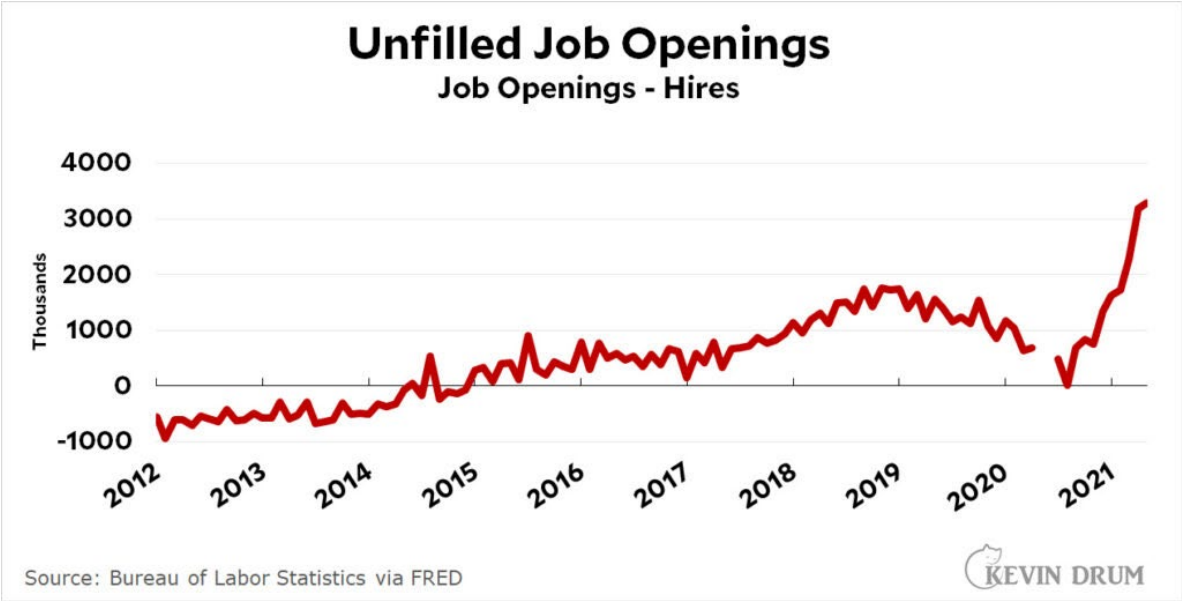


Note: House divisions of power reflect likely special-election outcomes given partisan leanings of districts.

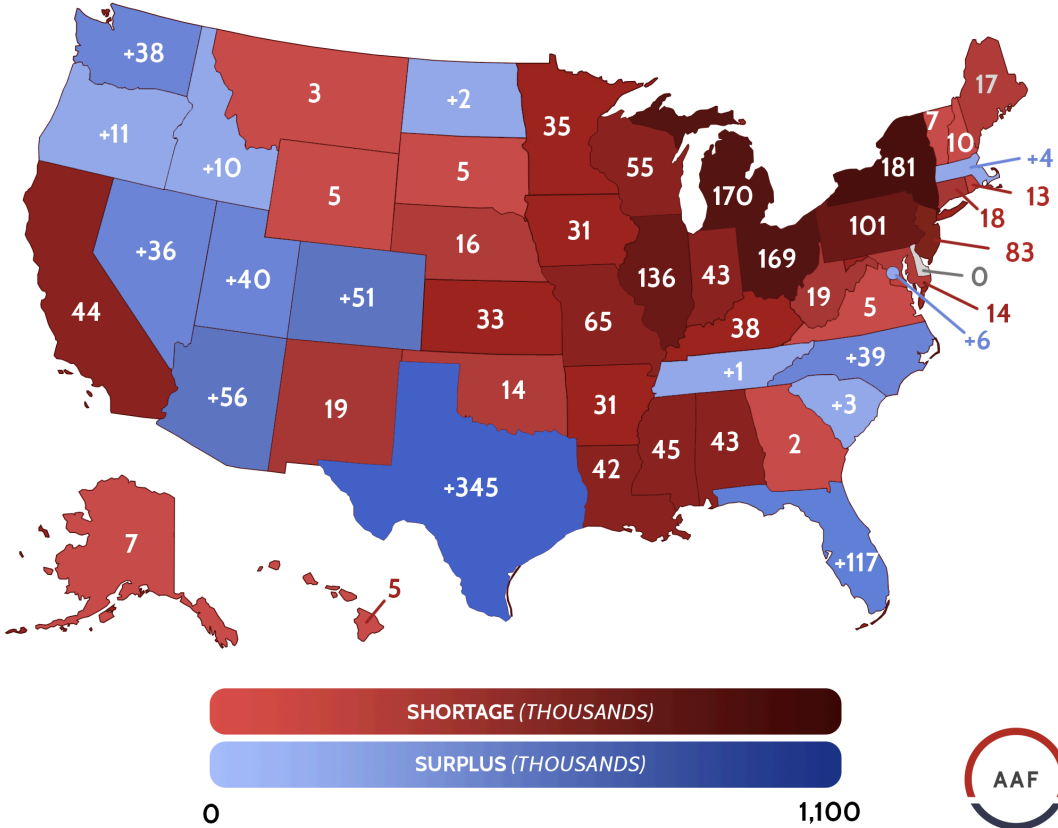
General Election: Right Track/Wrong Track



Workforce Shortages Widespread

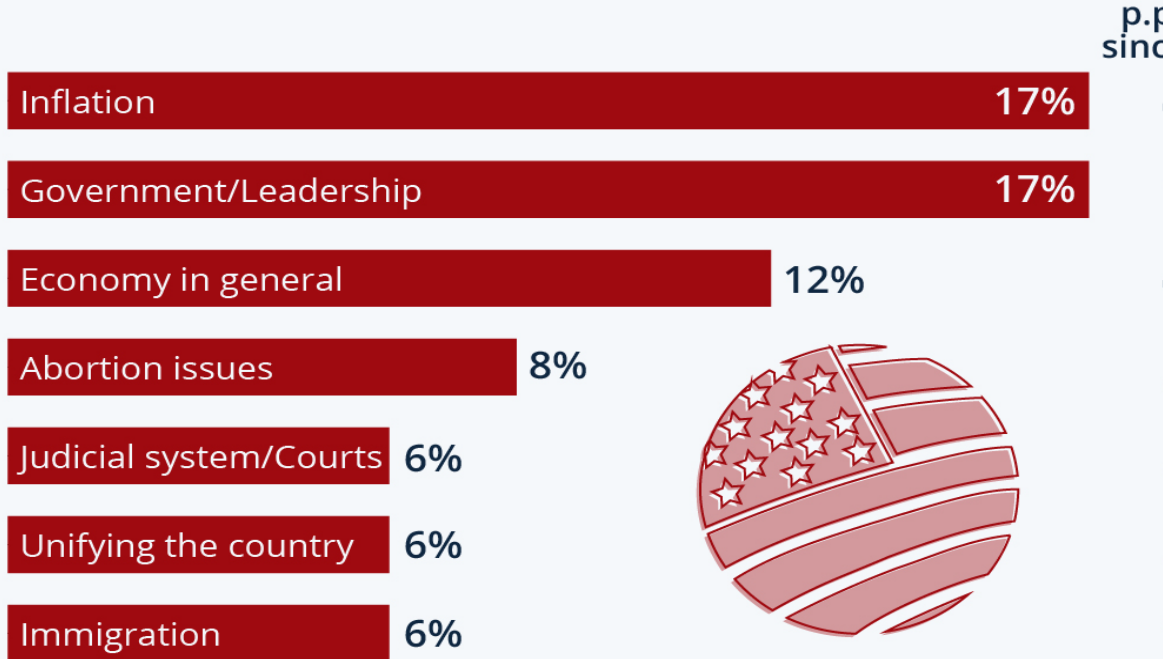


ESTIMATED SHORTAGE OF WORKERS WITH ASSOCIATE DEGREE OR SOME COLLEGE IN 2029



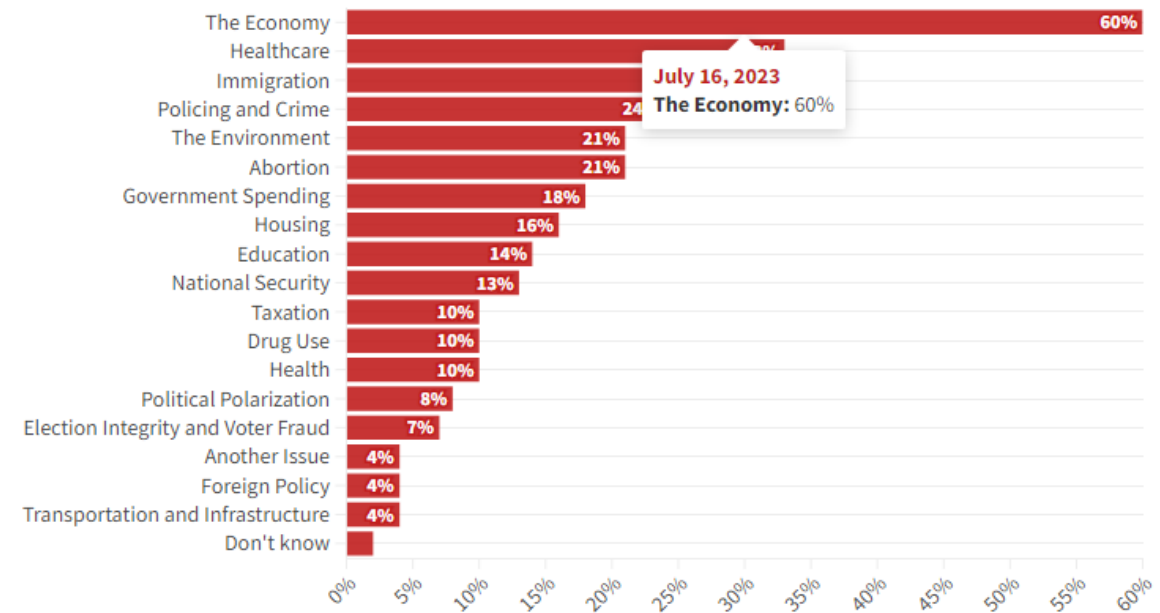
General Election: Leading issues in 2022 and 2023

What do you think is the most important problem facing this country today? (July 2022)



Based on surveys of 1,000+ U.S. adults
Source: Gallup

Which of the following issues do you believe are the most important issues in the country today? You may select up to three



Source: Redfield & Wilton Strategies

A Snap Shot on American's K-12 Priorities

Americans are most likely to say core academic subjects are extremely important for grades K-8. They see skills for future employment and academics as extremely important for grades 9-12.






What do you believe should be the main purpose of education during Kindergarten through 8th grade/High School? In your opinion, how important is it for students to learn...

All Adults

% Extremely Important








Grades K-8

Average % selected Extremely Important **41%**

-  Core academic subjects (58%)
-  To become independent thinkers (47%)
-  Skills for future employment (45%)
-  Socialization (44%)
-  How to be good citizens (42%)
-  Values, moral character, religious virtues (35%)
-  To fix social problems (16%)

Grades 9-12

Average % selected Extremely Important **44%**

-  Skills for future employment (58%)
-  Core academic subjects (53%)
-  Become independent thinkers (49%)
-  How to be good citizens (47%)
-  Socialization (44%)
-  Values, moral character, religious virtues (36%)
-  To fix social problems (18%)

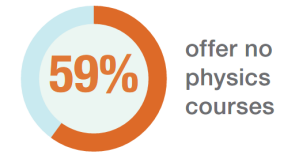
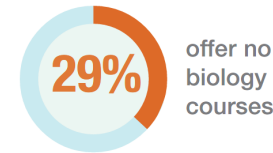
Science Education as an Emerging Priority Area

20 minutes per day to science

90 minutes per day to English/Language Arts

60 minutes per day to mathematics

Average time spent per day in elementary classrooms.



Science course offerings in schools where at least 80% of students are Black, Latino/a, or Indigenous.



Schools with large numbers of students living in poverty

90%

Schools with low numbers of students living in poverty

43%

Percentage of schools offering no physics course.

The CHIPS and Science Act

A woman with dark hair in a ponytail, wearing a blue lab coat and safety glasses, is focused on her work in a laboratory. She is wearing white gloves and using a tool to work on a small component on a dark surface. The background shows a well-lit lab with various pieces of equipment and shelves.

*How it can support
workforce development*

THE LAW SETS OUT
**TECHNICAL &
SOCIAL PRIORITIES**

Key technology focus areas

AI, machine learning, autonomy*	Advanced communications and immersive technologies*
Advanced computing, software, semiconductors*	Biotechnology*
Quantum information science*	Data storage and management, distributed ledger, cybersecurity*
Robotics, automation, advanced manufacturing	Advanced energy technology, storage, industrial efficiency*
Natural/anthropogenic disaster prevention and mitigation	Advanced materials science*

*Also related to Pentagon-identified Defense Critical Technology Area

Societal, national, and geostrategic challenges

U.S. national security	Climate change and sustainability
Manufacturing and industrial productivity	Inequitable access to education, opportunity, services
Workforce development and skills gaps	

CHIPS AND SCIENCE PROVIDES HISTORIC RESOURCES FOR WORKFORCE DEVELOPMENT – NOT JUST "INNOVATION"

BROOKINGS  

RESEARCH

How federal, state, and local leaders can leverage the CHIPS and Science Act as a landmark workforce opportunity



Photo credit: Shutterstock

Martha Ross and Mark Muro
January 4, 2024

- ❑ Authorizes tens of billions for 33 programs focused on STEM education, training, outreach
- ❑ Includes training for sub-BA skilled technical work in addition to support for college and graduate students
- ❑ Seeks to integrate economic and workforce development
- ❑ Primary agencies involved: the Department of Commerce, the National Science Foundation, the Department of Energy, and the Department of Defense



CHIPS AND SCIENCE WORKFORCE PROGRAMS FALL IN 3 CATEGORIES

Semiconductor-focused

- ❑ *CHIPS Incentives Program*
- ❑ *CHIPS R&D portfolio, including the National Semiconductor Technology Center*
- ❑ *CHIPS for America Workforce and Education Fund*

STEM education & workforce development within industrial strategy

- ❑ *Technology and Innovation Hubs*
- ❑ *Regional Innovation Engines*
- ❑ *Manufacturing Extension Partnerships; Manufacturing USA*

Standalone STEM education and workforce programs

- ❑ *Scholarships, fellowships, and internships*
- ❑ *Curriculum development and informal learning opportunities*
- ❑ *Supporting and diversifying the STEM education workforce*

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SOME OF THE LAW'S MOST AMBITIOUS
ELEMENTS ARE

PLACE-BASED

Place-based industrial strategy

noun

strategies that:

- 1) encourage **economic transformation** through interventions in particular industries
- 2) Seek to better leverage **concentrations of talent, suppliers, and knowledge** that cluster and interact in place to spur development

Addressing distress

RECOMPETE PILOT PROGRAM

industry-agnostic support of distressed communities

Growing clusters

BUILD BACK BETTER REGIONAL CHALLENGE

advancing equity through multi-stage cluster development

CHIPS INCENTIVES PROGRAM

strengthening industry and enhancing national security

REGIONAL TECHNOLOGY HUBS

fostering global competitiveness in existing tech clusters

REGIONAL INNOVATION ENGINES

catalyzing technology and science-based innovation

Catalyzing innovation

5 MAJOR PLACE-BASED PROGRAMS

\$60 BILLION

Major place-based industrial programs in the American Rescue Plan and CHIPS and Science Act



FINAL THOUGHTS

- The Act stands out as a milestone for pairing industry development and technological advancement with workforce training.
- Its success will depend upon sustained follow-through by leaders at federal, state, and local levels – including the public, private, and social sectors
 - ❑ Continued funding
 - ❑ Continued coordination across sectors and agencies

Timeline of 2024 CHIPS Awards

April 2024

- Micron, which plans to build two new fabrication plants in upstate New York and another in Boise, Idaho – where its headquarters is located, got [\\$6.14 billion in funding](#).
- Samsung got \$6.4 billion to build leading-edge logic, R&D, and advanced packaging fabs in Taylor, TX, and to expand a current-generation and mature-node facility in Austin, TX.
- TSMC got \$6.6 billion to support the development of three greenfield leading-edge fabs in Phoenix, AZ.

March 2024

- Intel was awarded [\\$8.5 billion](#) in funding, the most of any CHIPS Act allocations to date. Intel expects to use the money to advance its commercial semiconductor projects in Arizona, New Mexico, Ohio and Oregon.

February 2024

- NSTC in Albany, NY was promised [more than \\$5 billion](#) in funding.
- GlobalFoundries, in Malta, N.Y. and Essex Junction, VT. , 1.5 billion to help them expand and create new manufacturing capacity and capabilities for automotive, IoT, aerospace, defense, and other markets.

January 2024

- Microchip Technology Inc. got \$162 million to increase its production of microcontroller units and other specialty semiconductors, and to support the modernization and expansion of fabrication facilities in Colorado Springs, CO, and Gresham, OR.

National Defense Authorization Act

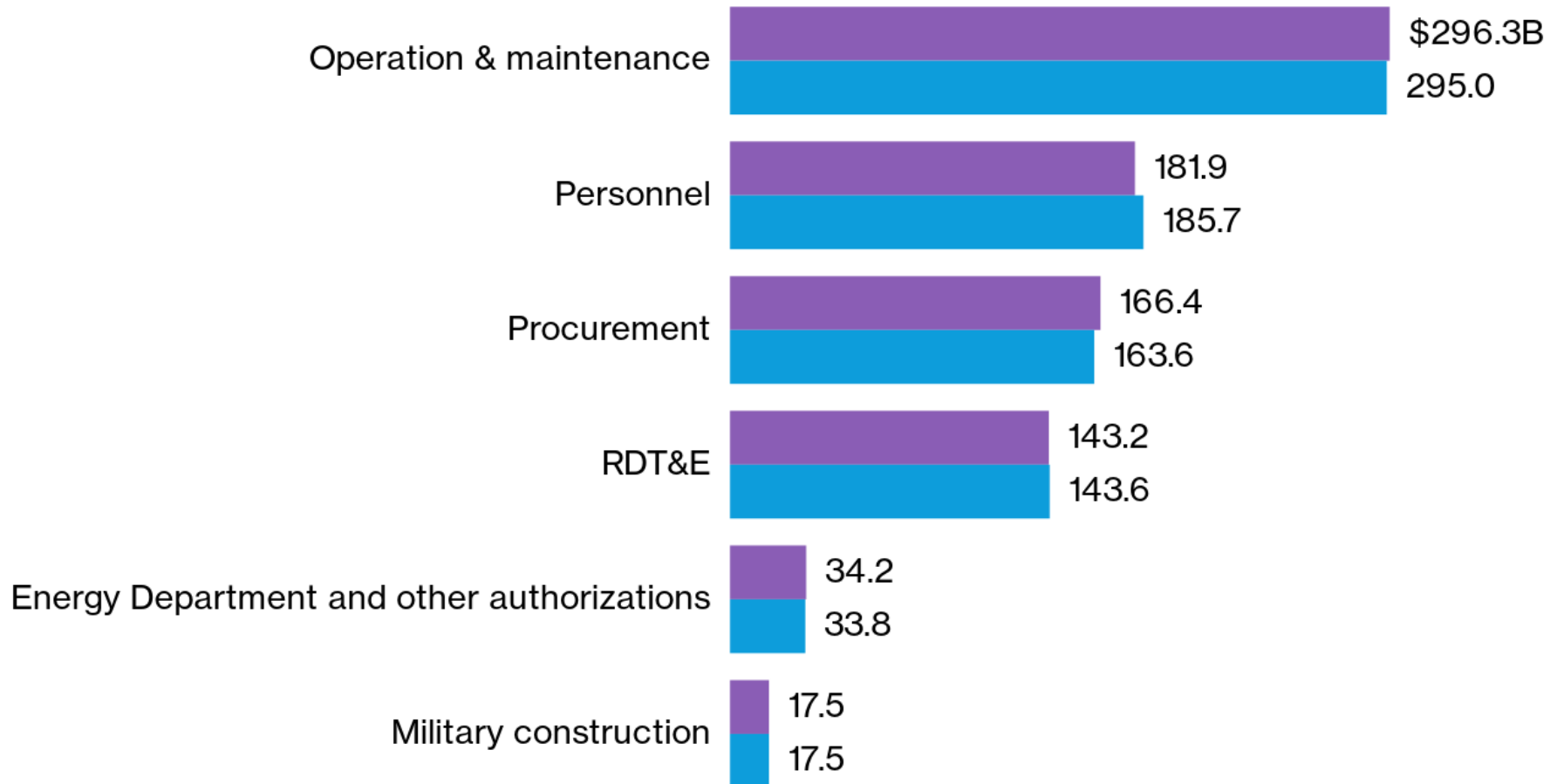
- ▶ The House passed its fiscal 2025 defense authorization bill ([H.R. 8070](#)) on June 14th
 - Cuts proposed for shipbuilding and aircraft programs in fiscal 2025
 - Would boost pay for junior enlisted troops, expand housing allowance
- ▶ Measure is considered a must-pass bill and has been enacted annually for more than 60 years
 - House Armed Services Committee approved the bill 57-1 on May 22
 - Senate Armed Services Committee starts its markup today
- ▶ This briefing covers the House bill, including:
 - Major authorization levels
 - Highlights of weapon systems
 - Key policy provisions and amendments to watch
 - A STEM community idea to parallel the CHIPS Act



House Defense Policy Bill Would Authorize

\$895.2 Billion for Fiscal 2025
Funding would align with spending caps set by the June 2023 debt-limit deal ([Public Law 118-5](#))

■ Fiscal 2025 Request ■ House Proposal



Notes: RDT&E – research, development, test, and evaluation
Sources: [H.R. 8070](#); House Armed Services Committee [report](#)

Bill Proposes Cuts to Shipbuilding, Aircraft Procurement

BRANCH	O&M		PROCUREMENT		RDT&E	
	Request	House	Request	House	Request	House
Army	\$59.2B	\$59.0B	\$24.4B	\$24.6B	\$14.1	\$14.1
Navy	75.0	75.0	72.8	71.1	25.7	26.1
Marine Corps	10.6	11.3	4.2	3.6	—	—
Air Force	64.6	64.4	55.2	54.9	49.1	49.2
Space Force	5.3	5.3	4.3	3.9	18.7	18.6
Defensewide	54.2	52.5	5.4	5.5	35.2	35.2
TOTAL	296.3	295.0	166.4	163.6	143.2	143.6

Notes: O&M – operation and maintenance; RDT&E – research, development, test, and evaluation. Marine Corps procurement for ammunition is included in Navy's procurement figure. O&M totals include other accounts such as environmental restoration and counter-ISIS funds.
 Sources: [H.R. 8070](#); House Armed Services Committee [report](#)

Funds for Frigate Nixed, Submarine Boosted



\$0 for Constellation-class FFG frigate

Request: 1 | House: 0

- ▶ Lawmakers rejected the administration's requested \$1.2 billion for the program in fiscal 2025 citing program [delays](#)
- ▶ Lawmakers also noted the ship won't require any funding for several years; \$2.6 billion [obligated](#) so far



\$4.3 billion for Virginia-class [submarine](#)

Request: 1 | House: 2

- ▶ The committee opted to boost authorization to two boats, which are central to the Australia-UK-US defense alliance
- ▶ The [administration](#) and some [lawmakers](#) say the submarine industrial base can't build more than one boat per year



\$4.8 billion for Arleigh Burke-class DDG-51 destroyer

Request: 2 | House: 2

- ▶ The Navy is also developing early-phase requirements for a new large surface combatant ship known as DDG(X)
- ▶ Navy currently has 73 Arleigh Burke-class destroyers in [service](#)



\$3.3 billion for Columbia-class SSBN

Request: 1 | House: 1

- ▶ The SSBN is a top priority program for the Navy, but delivery of the first boat is [delayed](#) by up to 16 months
- ▶ House's top defense appropriator [blamed](#) subcontractor Northrop Grumman Corp. over delayed turbine generators; bow made by HII also faces delay

Troop Pay Boost and Recruitment Get Spotlight

Pay and Benefits

- Provide 19.5% pay boost for junior enlisted service members and 4.5% for all service members
- Authorize \$1.2 billion for fiscal 2025 to fully fund basic allowance for housing, expand eligibility by increasing the limitation on household income to 200% of poverty line, from 150%, and similarly increase the allowance amount
- Increase military leave accrual and accumulation for federal employees to 20 days from 15 days
- Allow regular service members to be entitled to incentive pay for explosive ordnance disposal duty

Recruitment

- **Automatically register every male US citizen and resident between 18 and 26 years old for the Selective Service**
- **Bar the military services from requiring cannabis testing as a condition of enlistment or obtaining a commission**
- Allow DOD to reimburse applicants up to \$100 for costs of medical appointments required for entrance processing
- Direct DOD to implement strategy to re-recruit individuals discharged from the military for refusing Covid-19 vaccines
- Require DOD to appoint a chief talent management officer to implement talent recruitment and training strategy

China, Israel on Lawmakers' Radar For Fiscal 2025

China-Related Provisions

- Authorize \$1.2 billion for the Pacific Deterrence Initiative
- Require DOD to disassemble Chinese drones to pinpoint the origin of each component
- Direct DOD to review Chinese uncrewed aircraft systems manufacturers to determine if they should be designated as a Chinese military company subject to contracting restrictions
- Bar funds for DOD to:
 - Support any entertainment company with an agreement with Chinese media entities that produce propaganda content
 - Support any work performed by EcoHealth Alliance
 - Contract with any company that retains a foreign agent that lobbies on behalf of Chinese military companies

Other Foreign Policy Provisions

- Authorize \$30 million for US-Israel anti-tunnel cooperation and require DOD to conduct subterranean warfare exercises with Israel and other allies
- Prohibit funds to share information with Russia as required by the New START Treaty
- Direct DOD to report lessons learned from the war in Ukraine, including combat effectiveness of US defense equipment provided to Ukraine
- Bar higher education institutions that conduct DOD research from contracting with foreign countries, including China, Iran, North Korea, and Russia
- Bar DOD from purchasing LIDAR technology manufactured by China, Iran, North Korea, and Russia
- Authorize DOD to provide training and equipment to foreign countries to support space domain awareness and defensive operations

Additional Service Branches, Blast Study Would Be Authorized

Ships and Maritime	Health	Other Provisions
<ul style="list-style-type: none"> Require the Navy to fully complete a vessel's design and confirm vendor selection is complete before starting construction on first ship of a shipbuilding program Authorize the Navy to use shipbuilding funds in fiscal 2025 to incrementally fund the Virginia-class submarine Bar DOD from retiring the USS Shilo and USS Lake Erie guided missile cruisers Require the Transportation Department to build up military and civilian sealift capacity to support US strategic sealift 	<ul style="list-style-type: none"> Authorize \$40.3 billion for Defense Health Program Require TRICARE to cover assisted reproductive technology, including in vitro fertilization Eliminate cost-sharing for one year for most beneficiaries purchasing contraceptives Eliminate dental copays and premiums for members of the Selected Reserve Require DOD to set thresholds for blast exposure and blast overpressure safety; also require the department to train service members on blast exposure 	<ul style="list-style-type: none"> Establish a Drone Corps as a separate branch of the Army Direct DOD to assess feasibility of establishing a Cyber Force as a separate branch dedicated to operations in the cyber domain Require the Missile Defense Agency to establish a third fully operational missile interceptor site on the East Coast by Dec. 31, 2030 Allow Air Force to transfer space functions of the Air National Guard to the Space Force with approval of state governors Authorize a special trial counsel to exercise authority over sexual harassment complaints that occurred between 2022 and 2025

Amendments Address Key Foreign

Topic	Description	Amendment/Sponsor
Israel	<ul style="list-style-type: none"> Bar DOD from contracting with a person engaged in activities intended to penalize commercial relations with Israel Bar military exchanges or commissaries from knowingly selling any products from an entity engaged in a boycott of Israel Authorize \$47.5 million for the DOD to carry out joint research programs with Israel to promote emerging defense technologies 	<ul style="list-style-type: none"> No. 4 from Rep. Lauren Boebert (R-Colo.) No. 9 from Rep. John Curtis (R-Utah) No. 250 from Rep. Ronny Jackson (R-Texas)
Gaza	<ul style="list-style-type: none"> Bar funds for DOD to build in or rebuild the Gaza strip Prohibit funds for DOD to maintain a pier off the coast of Gaza to transport humanitarian aid Require DOD to assess the accuracy of Gaza Health Ministry's reported casualty figures in Gaza, including casualties grouped by age and gender 	<ul style="list-style-type: none"> No. 5 from Rep. Brian Mast (R-Fla.) No. 12 from Rep. Nancy Mace (R-S.C.) No. 201 from Rep. Jared Moskowitz (D-Fla.)
Ukraine	<ul style="list-style-type: none"> Bar all funds authorized by the measure for Ukraine assistance Bar the use of authorized funds or previously appropriated funds for Ukraine until the president submits a strategy report on US involvement to Congress Bar DOD from transferring funds from military housing for Ukraine assistance Bar DOD funds in fiscal 2025 to sell or transfer cluster munitions, which are currently used in Ukraine 	<ul style="list-style-type: none"> No. 37 from Rep. Marjorie Taylor Greene No. 38 from Rep. Warren Davidson (R-Ohio) No. 39 from Rep. Paul Gosar (R-Ariz.) No. 40 from Rep. Matt Gaetz (R-Fla.)

How the Department of Defense Could Support STEM Education?

- DOD annually procures about \$166 billion from provide sector contractors
- DOD could establish an across the board education and workforce investment requirement for these contracts that would parallel the policy included in the CHIPS Act
- As an example, one half of one percent of this total – 0.5% – would amount to \$830 million annually that would be devoted to STEM education and workforce programs.
- This level of funding is roughly the same as the entire STEM education budget for the National Science Foundation
- NASA has done this before, devoting 1% to STEM programs