

# National Assessment of Educational Progress 2015 Science Results

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National Center for Education Statistics

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## Assessment administration: January – March 2015

### National samples

- 115,400 fourth-graders
- 110,900 eighth-graders
- 11,000 twelfth-graders

### Results available for

- Nation
- 46 volunteer states and the Department of Defense school system at grades 4 and 8
- Trends at grades 4 and 12 from 2009; at grade 8 from 2009 and 2011

### Performance reported as

- Average scale scores (0–300 scale)
- Achievement levels (*Basic, Proficient, Advanced*)

## Science Content Areas



**Physical science**



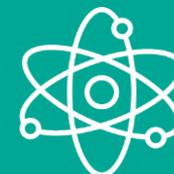
**Earth and space sciences**



**Life science**

## Percentage distribution of assessment time in 2015 NAEP science, by content area

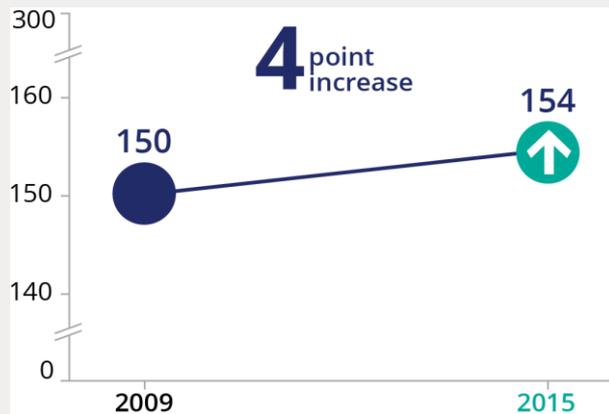
<b>Content area</b>	<b>Grade 4</b>	<b>Grade 8</b>	<b>Grade 12</b>
Physical science	<b>33%</b>	<b>29%</b>	<b>38%</b>
Earth and space sciences	<b>33%</b>	<b>40%</b>	<b>25%</b>
Life science	<b>34%</b>	<b>31%</b>	<b>37%</b>



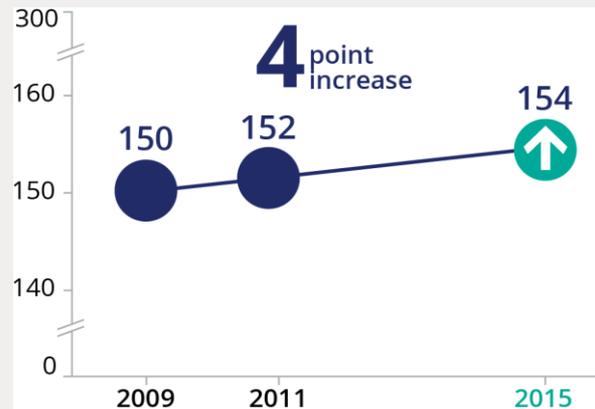
# Highlights of Results

## National score changes between 2009 and 2015

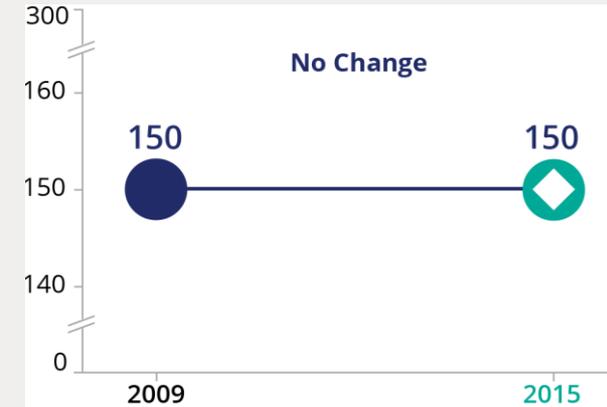
### Grade 4



### Grade 8



### Grade 12

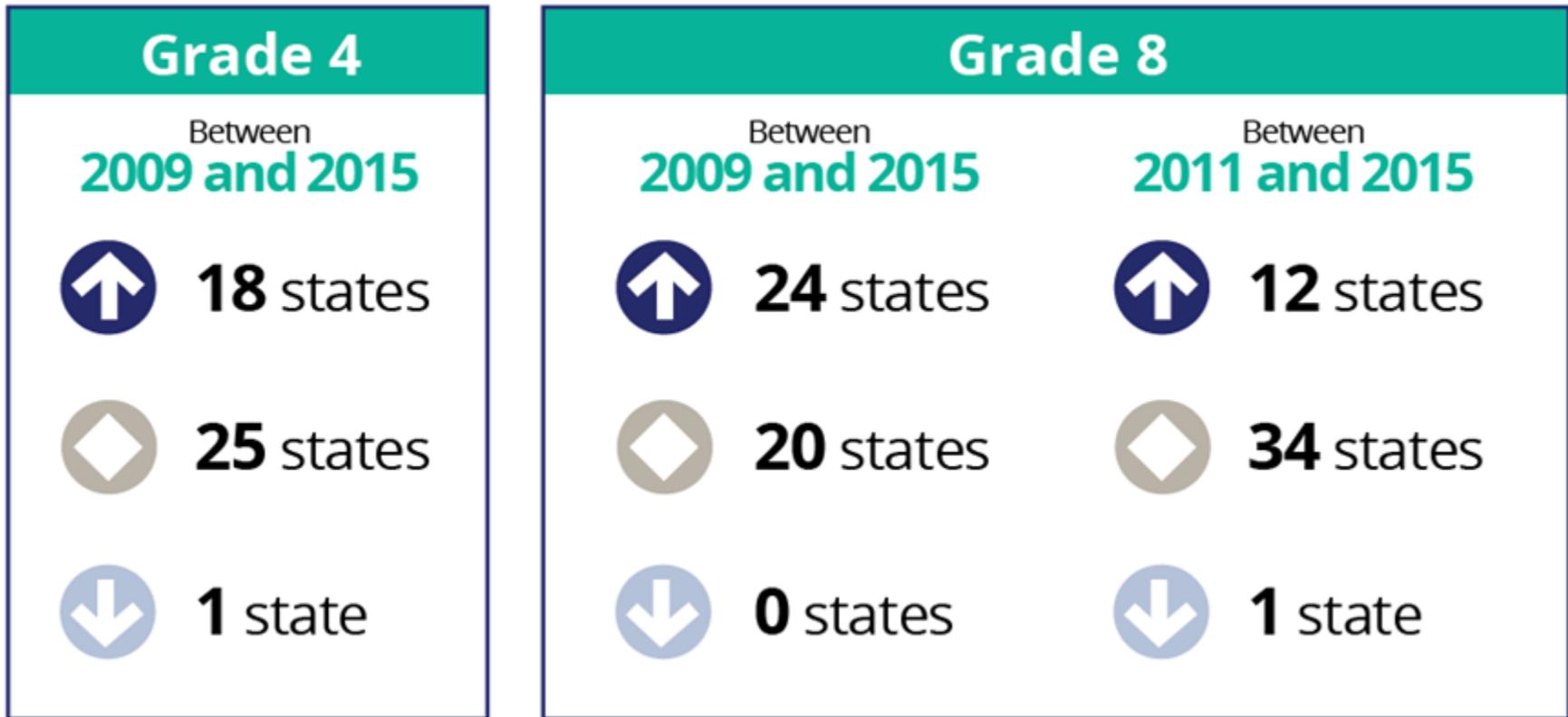


 Score increase from previous assessment years

 No significant change from previous assessment year

NOTE: Trend data available at grades 4 and 12 from 2009 and at grade 8 from 2009 and 2011.

## State score changes between 2009 and 2015



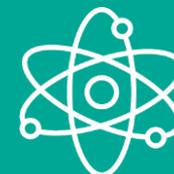
Score increase



No significant change

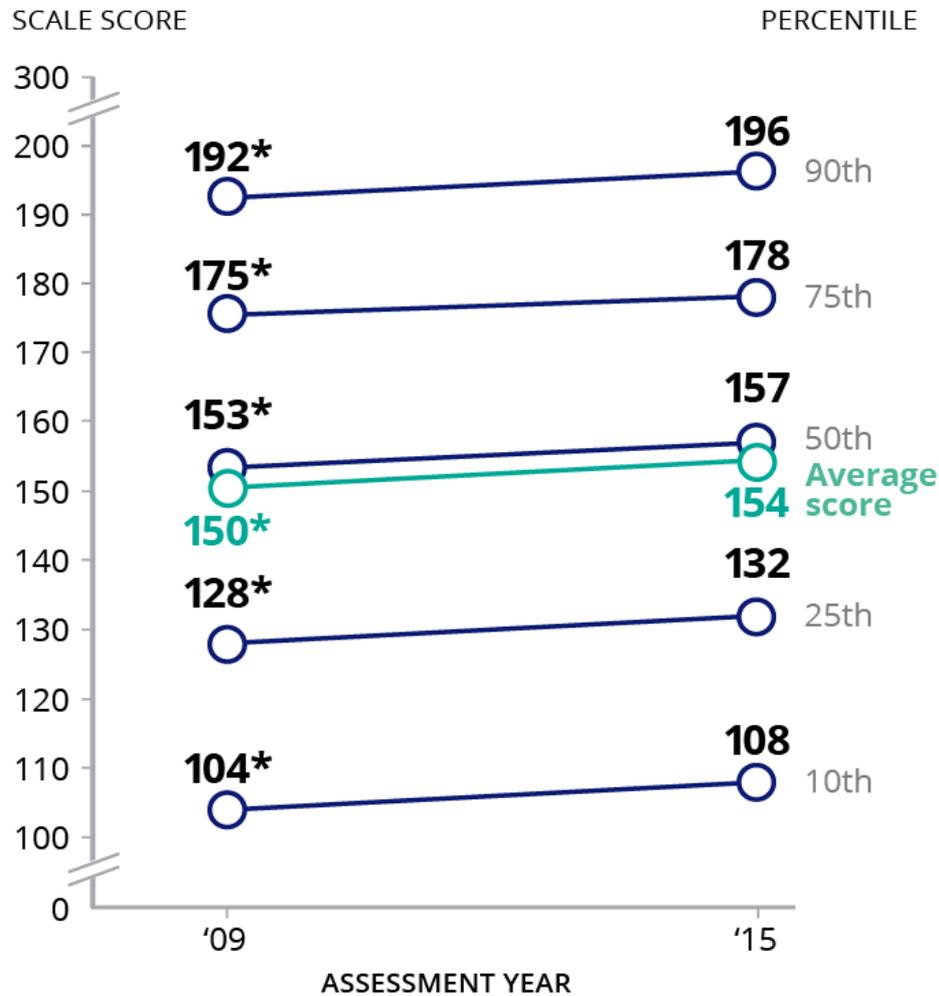


Score decrease



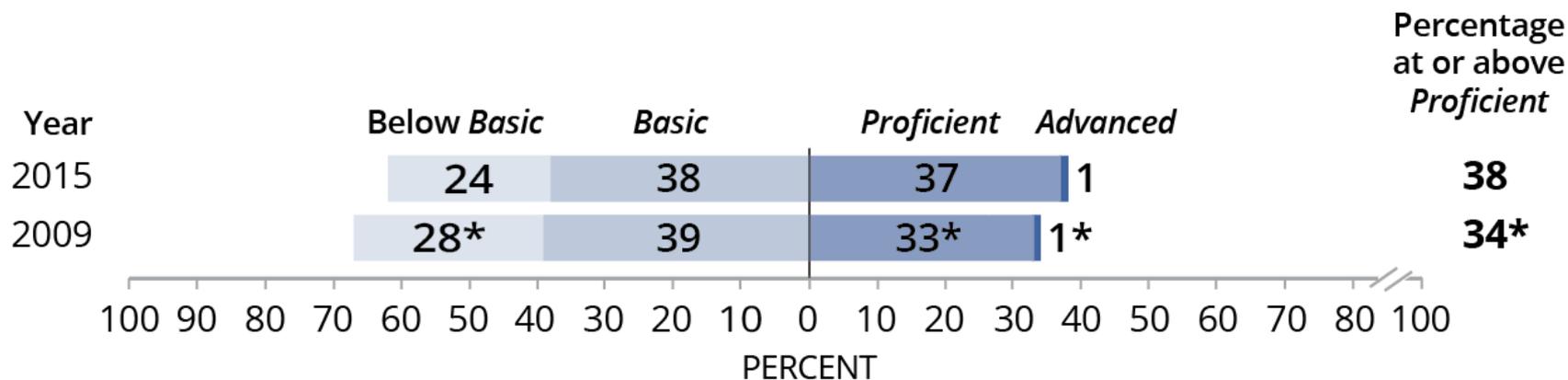
# Grade 4 Science Results

## Fourth-grade average score higher than 2009



\* Significantly different ( $p < .05$ ) from 2015.

## Percentage at or above *Proficient* higher than 2009

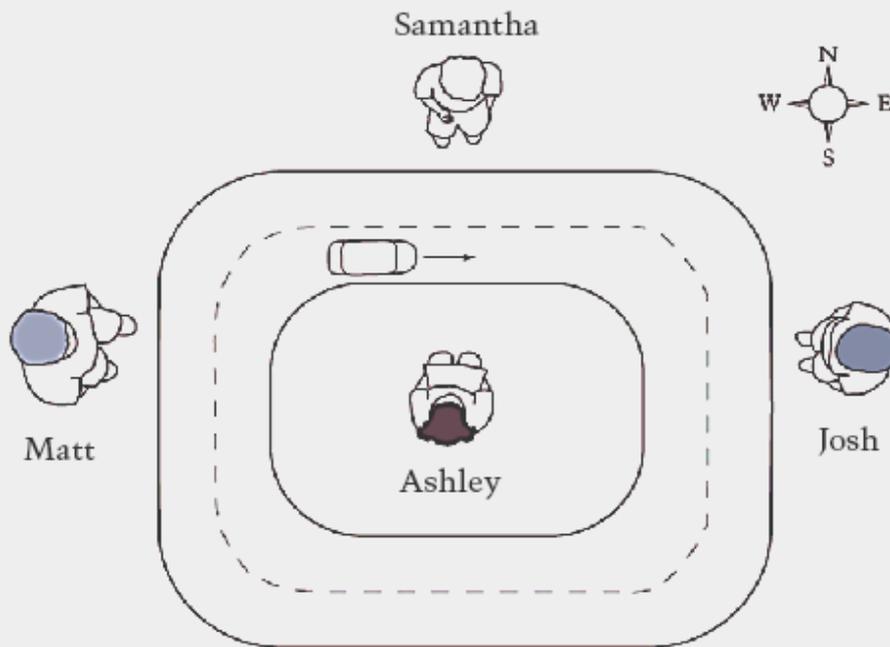


\* Significantly different ( $p < .05$ ) from 2015.

NOTE: Detail may not sum to totals because of rounding. The percentage comparisons are based on unrounded numbers rather than the rounded numbers shown in the graphic.

## Sample Question: Physical Science

The diagram below shows the top of a toy car as it travels on a curved track. Four students, Matt, Samantha, Josh, and Ashley stand in the positions shown and watch the toy car move.



When the toy car is in the position shown in the diagram, which student sees the car as moving away from him or her?

- (A) Ashley
- (B) Josh
- (C) Matt
- (D) Samantha

## Fourth-grade average scores in all content areas higher than in 2009

Content area	2015	2009
Physical science	154	150*
Earth and space sciences	155	150*
Life science	154	150*

\* Significantly different ( $p < .05$ ) from 2015.

## Scores increased across student groups since 2009

Student group	Average score in 2015	Score change from 2009
<b>All students</b>	<b>154</b>	<b>↑ 4</b>
<b>Race/ethnicity</b>		
White (51%)	166	↑ 3
Black (14%)	133	↑ 5
Hispanic (25%)	139	↑ 8
Asian/Pacific Islander (6%)	167	↑ 7
American Indian/Alaska Native (1%)	139	↑ 4
Two or More Races (3%)	158	↑ 4
<b>Gender</b>		
Male (51%)	154	↑ 4
Female (49%)	154	↑ 4

NOTE: Student group percentages in 2015 are shown in parentheses. The NAEP science scale ranges from 0–300.

↑ Score increased

## Scores increased across student groups since 2009

Student group	Average score in 2015	Score change from 2009
<b>All students</b>	<b>154</b>	<b>↑ 4</b>
<b>School location</b>		
City (31%)	148	↑ 6
Suburb (41%)	157	↑ 3
Town (11%)	153	↑ 2
Rural (17%)	157	↑ 3
<b>Eligibility for National School Lunch Program (NSLP)</b>		
Eligible (52%)	140	↑ 7
Not eligible (42%)	169	↑ 6

NOTE: Student group percentages in 2015 are shown in parentheses. The NAEP science scale ranges from 0–300. NSLP “information not available” category is not shown.

↑ Score increased

## Scores increased across student groups since 2009

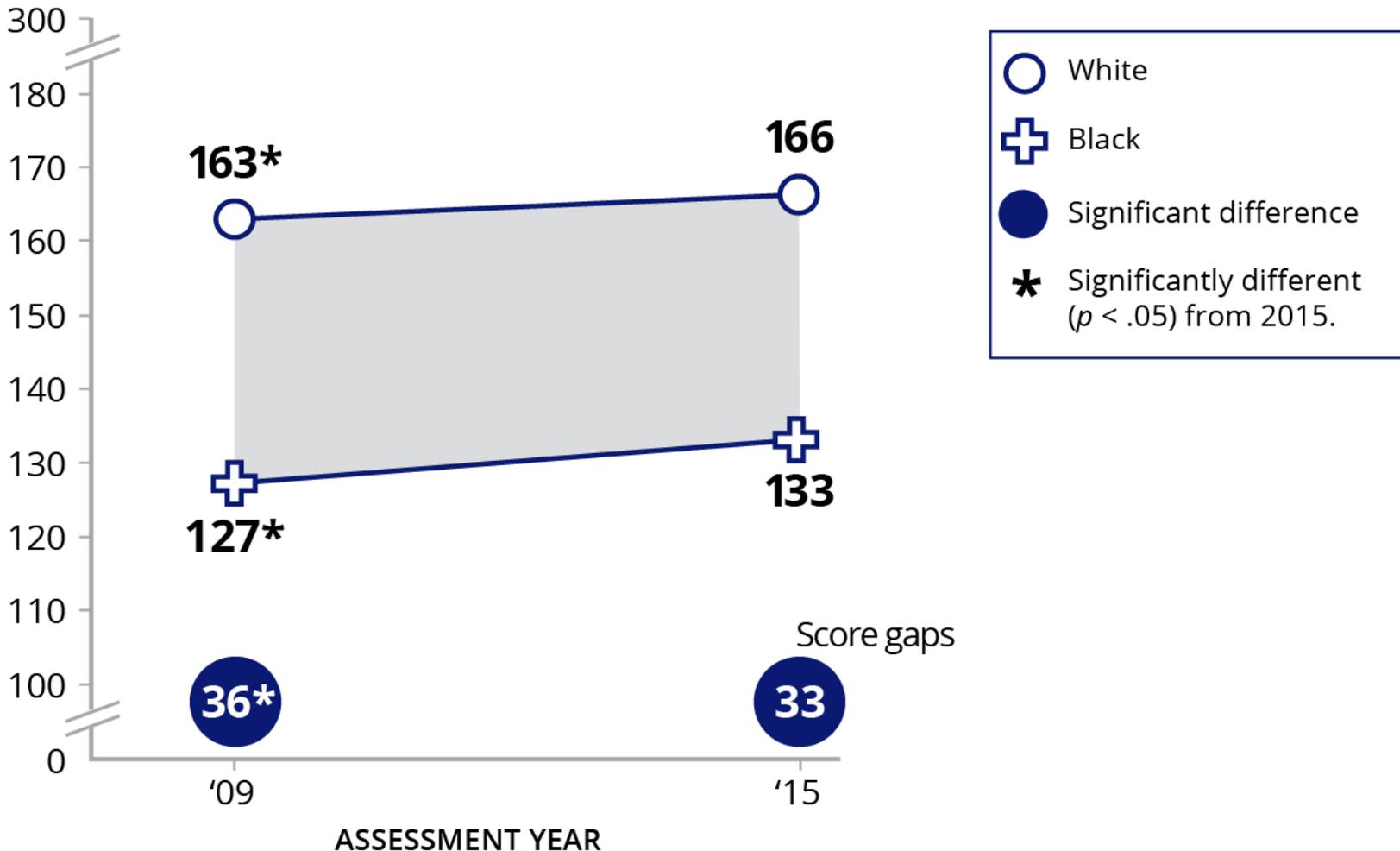
Student group	Average score in 2015	Score change from 2009
<b>All students</b>	154	↑ 4
<b>Status as students with disabilities (SD)</b>		
SD (13%)	131	↑ 2
Not SD (87%)	157	↑ 4
<b>Status as English language learners (ELL)</b>		
ELL (11%)	121	↑ 7
Not ELL (89%)	158	↑ 4

NOTE: Student group percentages in 2015 are shown in parentheses. The NAEP science scale ranges from 0–300.

↑ Score increased

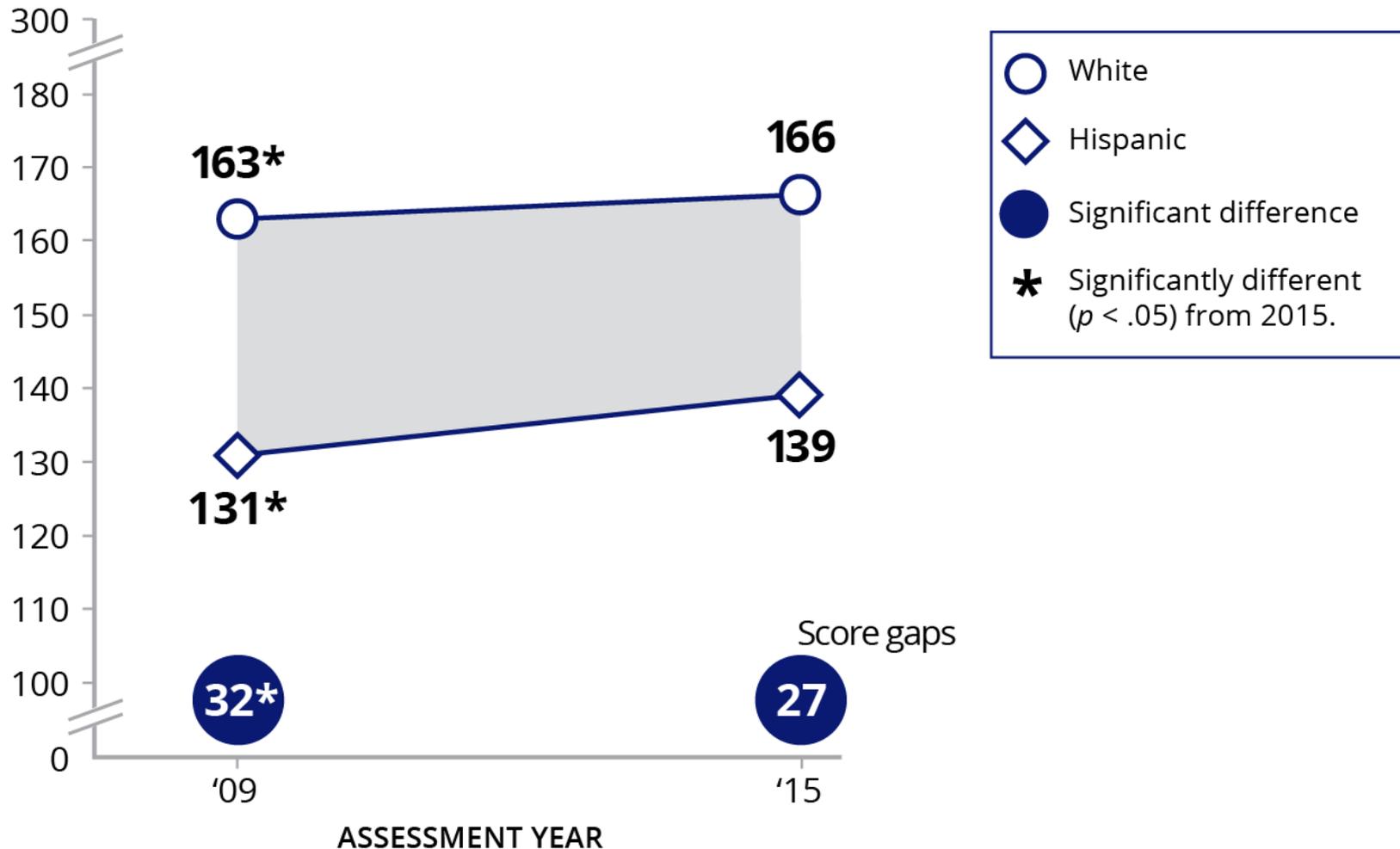
## White – Black score gap smaller compared to 2009

SCALE SCORE

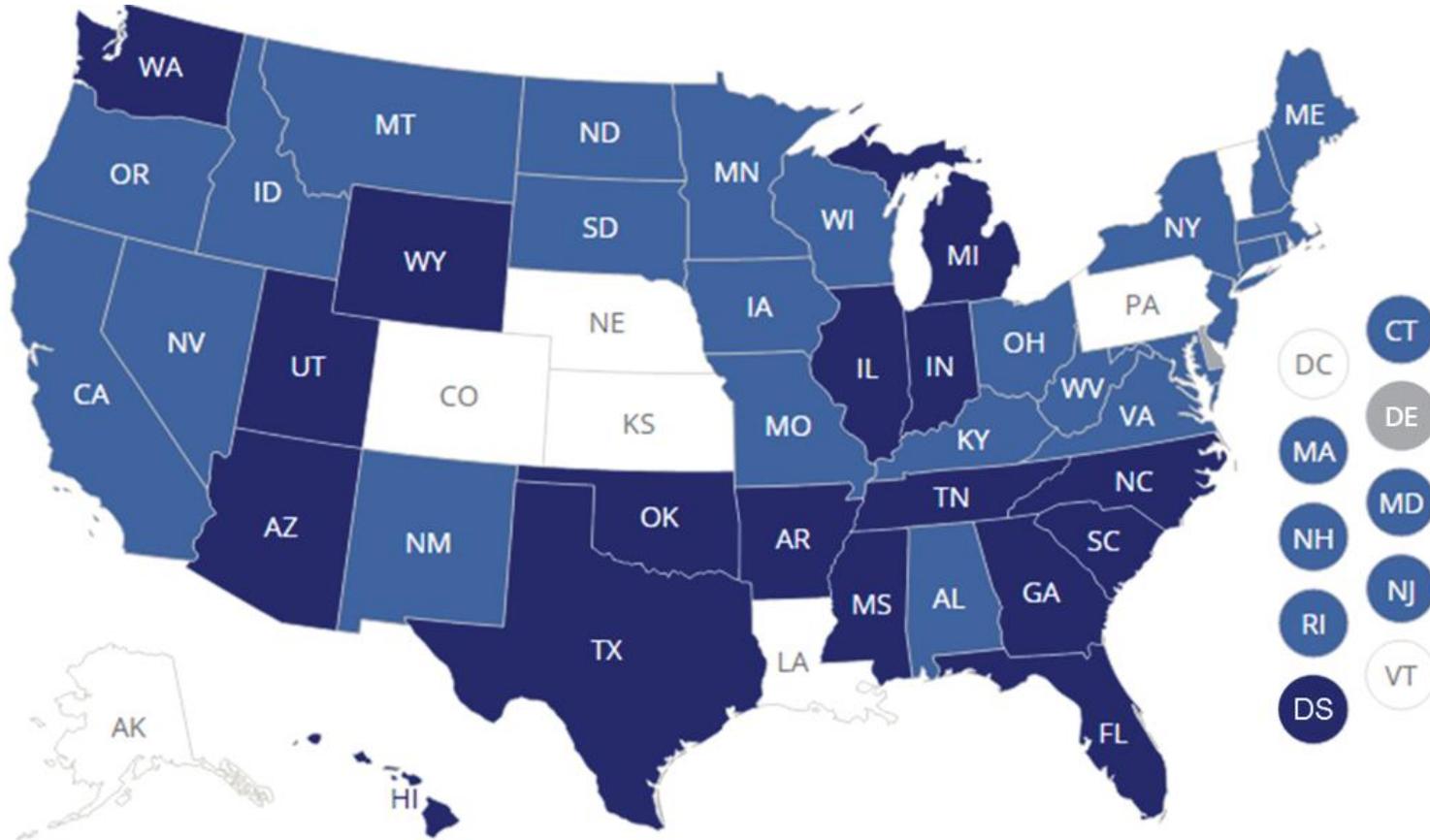


## White – Hispanic score gap smaller compared to 2009

SCALE SCORE



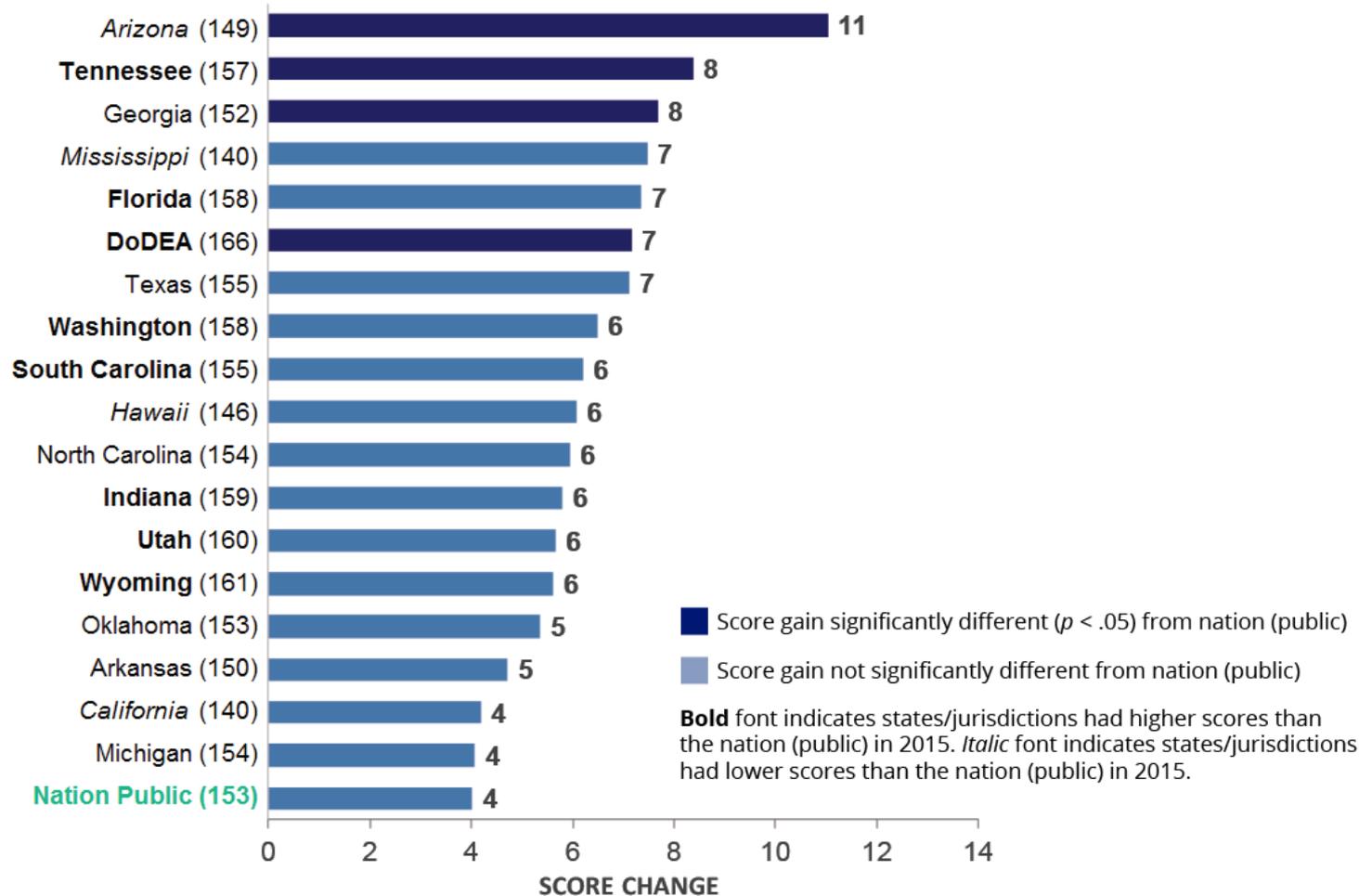
## Science scores increased in 18 states/jurisdictions and decreased in 1 state compared to 2009

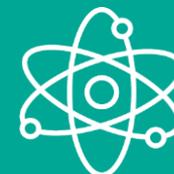


Score gain
  No significant score change
  Score loss
  No data/not applicable

NOTE: DS = Department of Defense Education Activity (DoDEA).

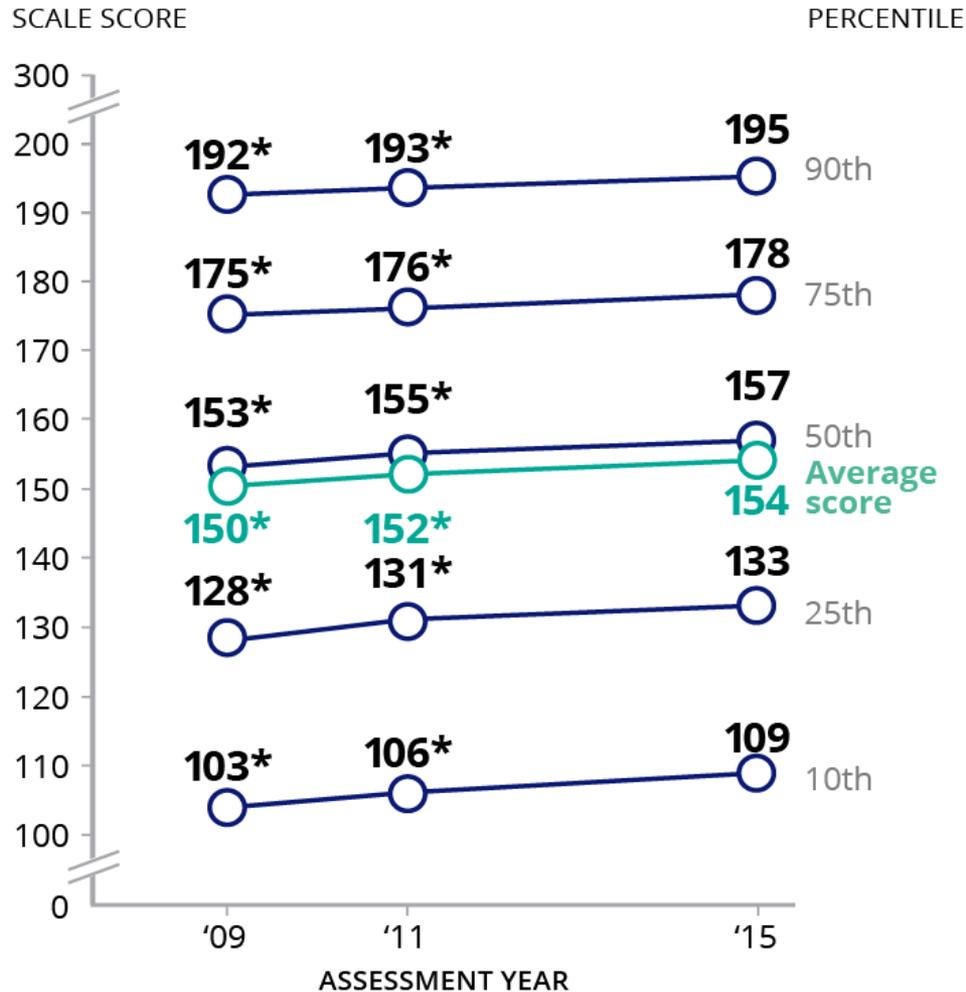
## Four states/jurisdictions had greater score gains than the nation since 2009





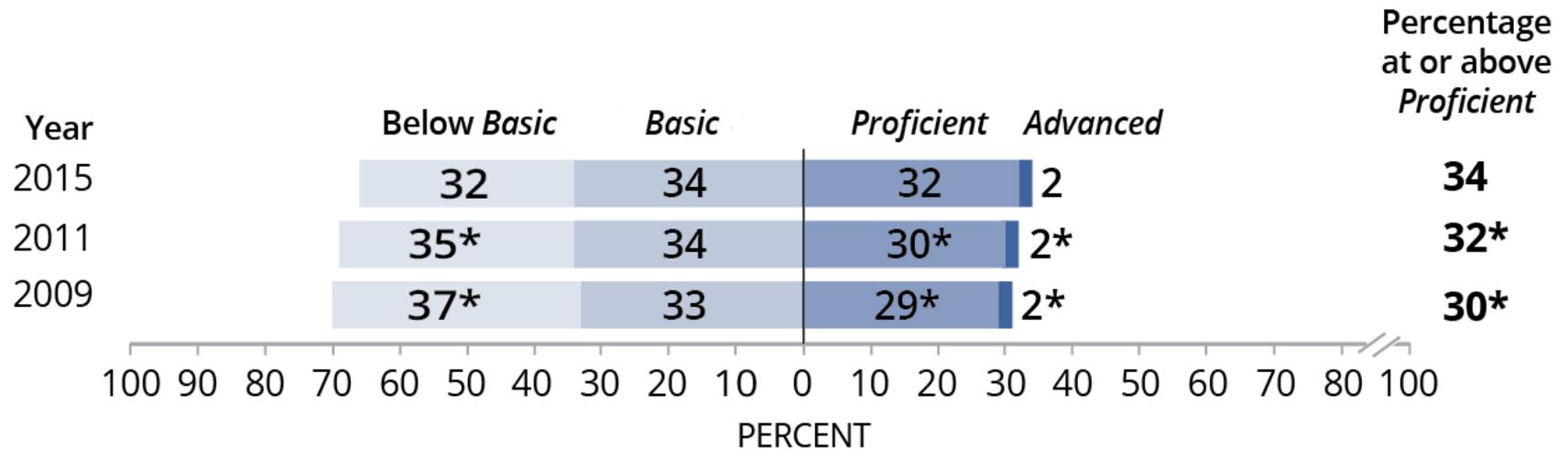
# Grade 8 Science Results

## Eighth-grade average score higher than 2011 and 2009



\* Significantly different ( $p < .05$ ) from 2015.

## Percentage at or above *Proficient* higher than 2011 and 2009



\* Significantly different ( $p < .05$ ) from 2015.

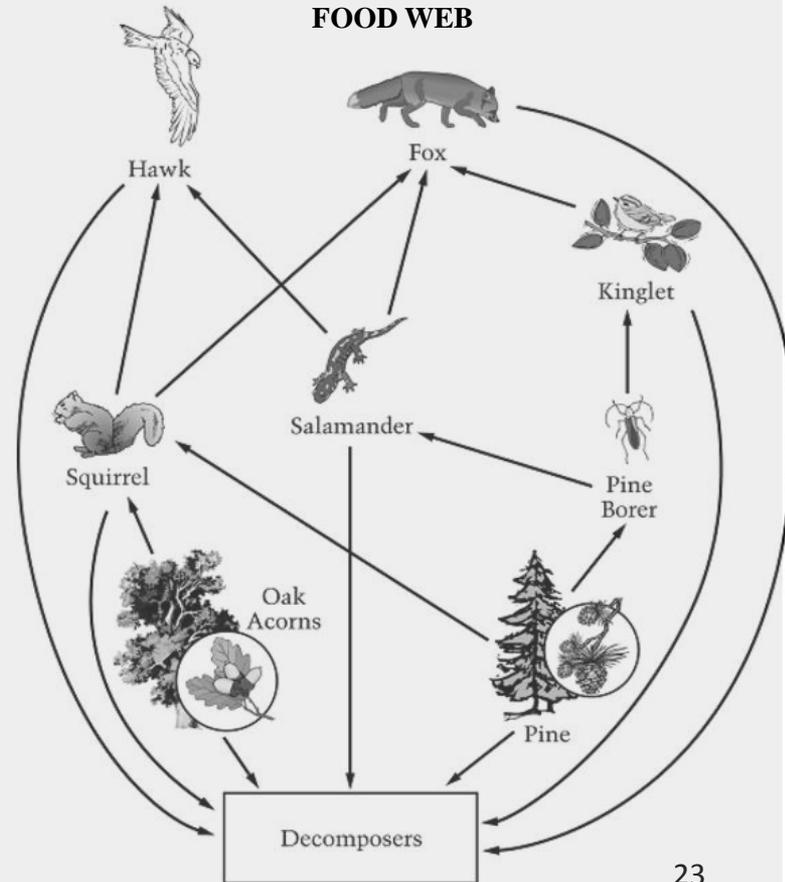
NOTE: Detail may not sum to totals because of rounding. The percentage comparisons are based on unrounded numbers rather than the rounded numbers shown in the graphic.

## Sample Question: Life Science

The diagram shows a food web. The arrows show the direction of energy flow. Each arrow points from the organism that is consumed to the organism that consumes it. Use the information in the food web to answer the question that follows.

Which statement best explains why decomposers are an important part of this food web?

- (A) They use sunlight to make their own food.
- (B) They give off oxygen for animals to breathe.
- (C) They provide camouflage for small animals.
- (D) They make nutrients available to plants.



## Eighth-grade average scores in all content areas higher than in 2009 and 2011

Content area	2015	2011	2009
Physical science	153	152*	150*
Earth and space sciences	152	151*	150*
Life science	155	152*	150*

\* Significantly different ( $p < .05$ ) from 2015.

## Scores for most student groups increased since 2011, 2009

Student group	Average score in 2015	Score change from 2011	Score change from 2009
<b>All students</b>	154	↑ 2	↑ 4
<b>Race/ethnicity</b>			
White (52%)	166	↑ 2	↑ 4
Black (15%)	132	↑ 3	↑ 6
Hispanic (24%)	140	↑ 3	↑ 8
Asian/Pacific Islander (6%)	164	↑ 5	↑ 5
Asian (5%)	166	↑ 6	—
Native Hawaiian/Other Pacific Islander (#)	138	◆ 2	—
American Indian/Alaska Native (1%)	139	◆ 2	◆ 2
Two or More Races (3%)	159	◆ 4	↑ 8
<b>Gender</b>			
Male (51%)	155	↑ 1	↑ 3
Female (49%)	152	↑ 3	↑ 4

# Rounds to zero.

— Not available.

NOTE: Student group percentages in 2015 are shown in parentheses. The NAEP science scale ranges from 0–300.

↑ Score increased

◆ No significant change 25

## Scores for most student groups increased since 2011, 2009

Student group	Average score in 2015	Score change from 2011	Score change from 2009
<b>All students</b>	<b>154</b>	<b>↑ 2</b>	<b>↑ 4</b>
<b>School location</b>			
City (30%)	148	↑ 4	↑ 5
Suburb (41%)	158	↑ 2	↑ 4
Town (11%)	154	◆ 1	↑ 4
Rural (18%)	156	◆ #	↑ 2
<b>Eligibility for National School Lunch Program (NSLP)</b>			
Eligible (48%)	140	↑ 3	↑ 7
Not eligible (45%)	167	↑ 3	↑ 6

# Rounds to zero.

NOTE: Student group percentages in 2015 are shown in parentheses. The NAEP science scale ranges from 0–300. NSLP “information not available” category is not shown.

↑ Score increased

◆ No significant change

## Scores for most student groups increased since 2011, 2009

Student group	Average score in 2015	Score change from 2011	Score change from 2009
<b>All students</b>	154	↑ 2	↑ 4
<b>Status as students with disabilities (SD)</b>			
SD (12%)	124	◆ #	◆ 2
Not SD (88%)	158	↑ 3	↑ 5
<b>Status as English language learners (ELL)</b>			
ELL (6%)	110	↑ 4	↑ 7
Not ELL (94%)	157	↑ 2	↑ 4

# Rounds to zero.

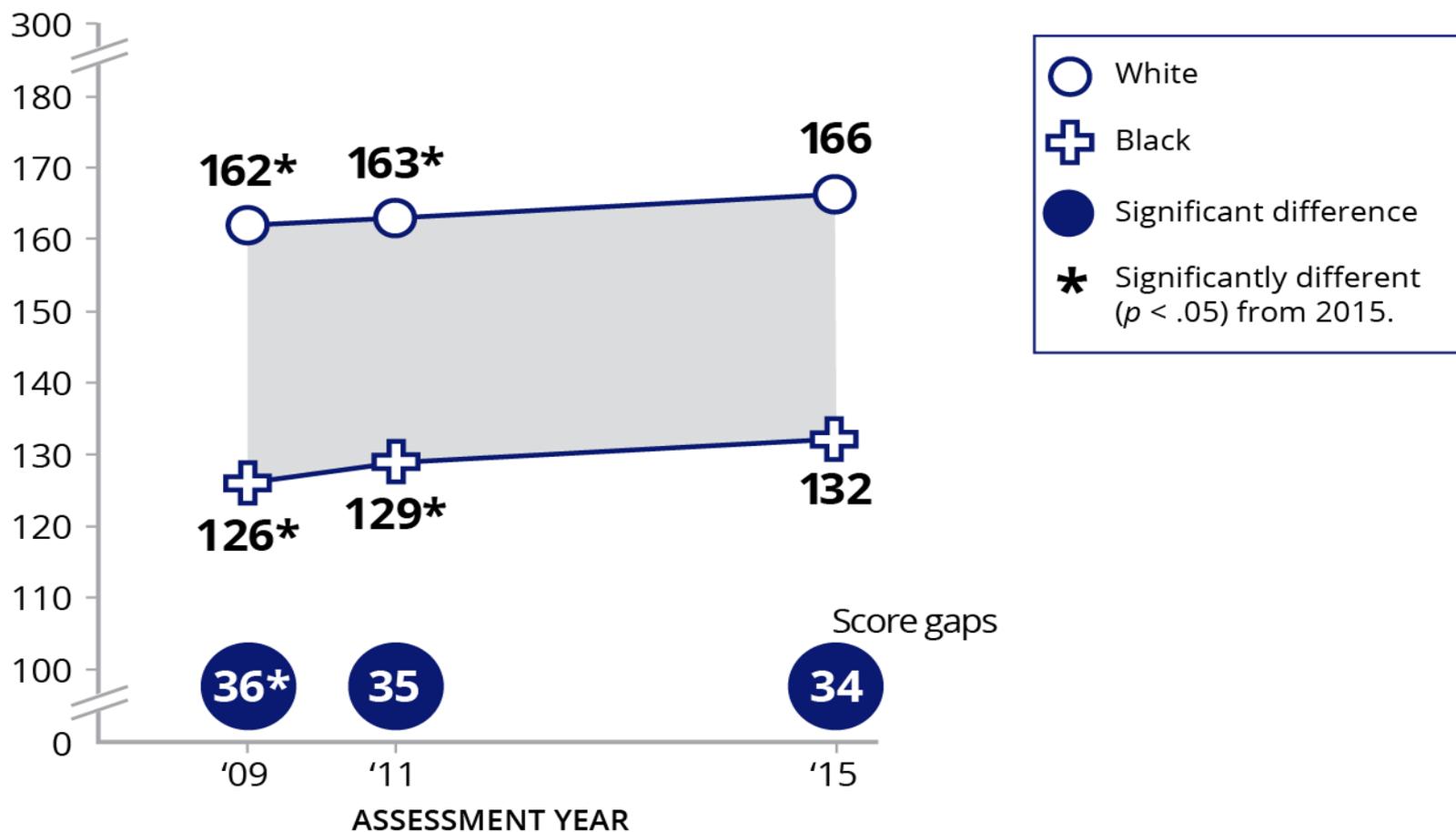
NOTE: Student group percentages in 2015 are shown in parentheses. The NAEP science scale ranges from 0–300.

↑ Score increased

◆ No significant change

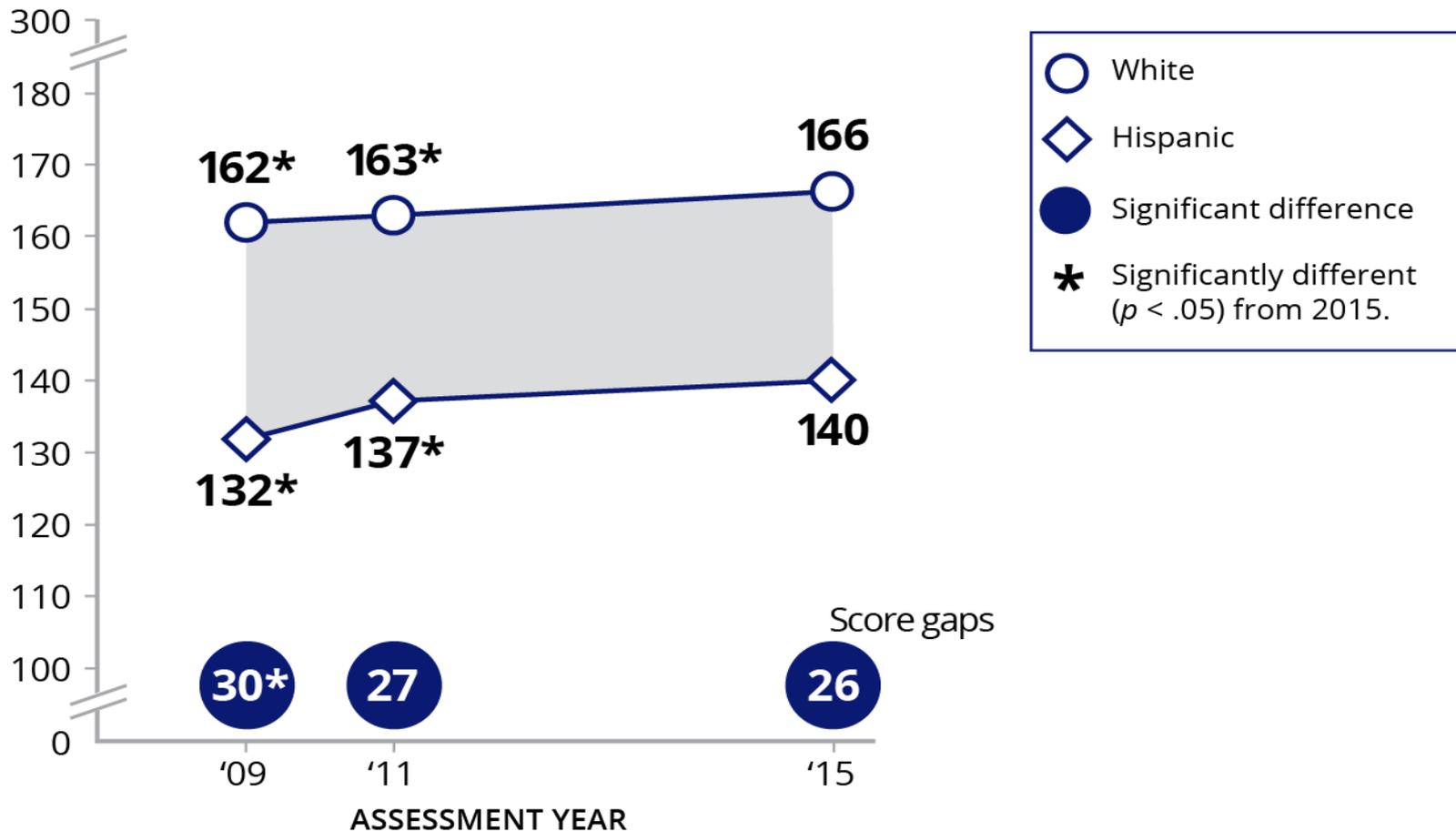
## White – Black score gap smaller compared to 2009; no change compared to 2011

SCALE SCORE

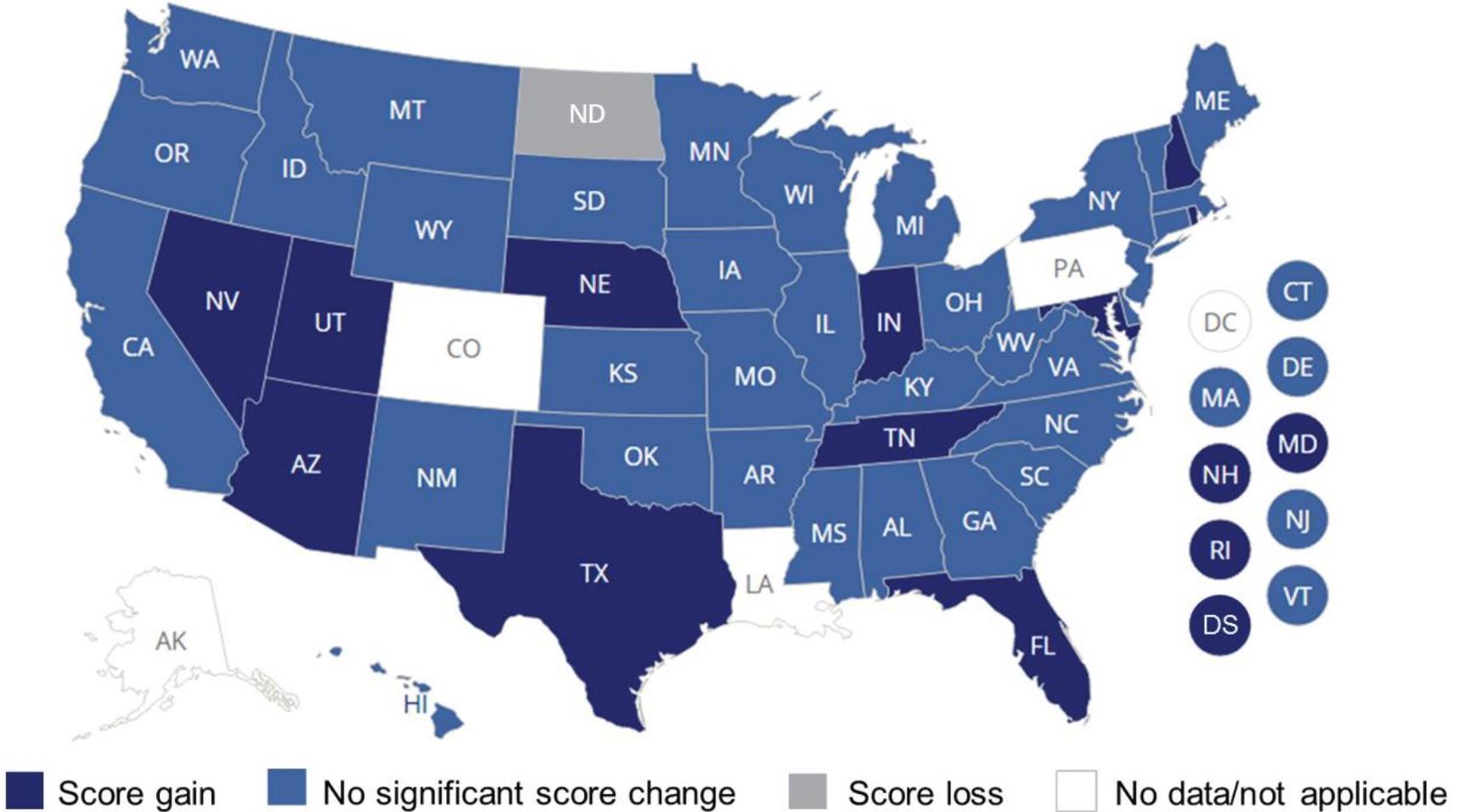


## White – Hispanic score gap smaller compared to 2009; no change compared to 2011

SCALE SCORE

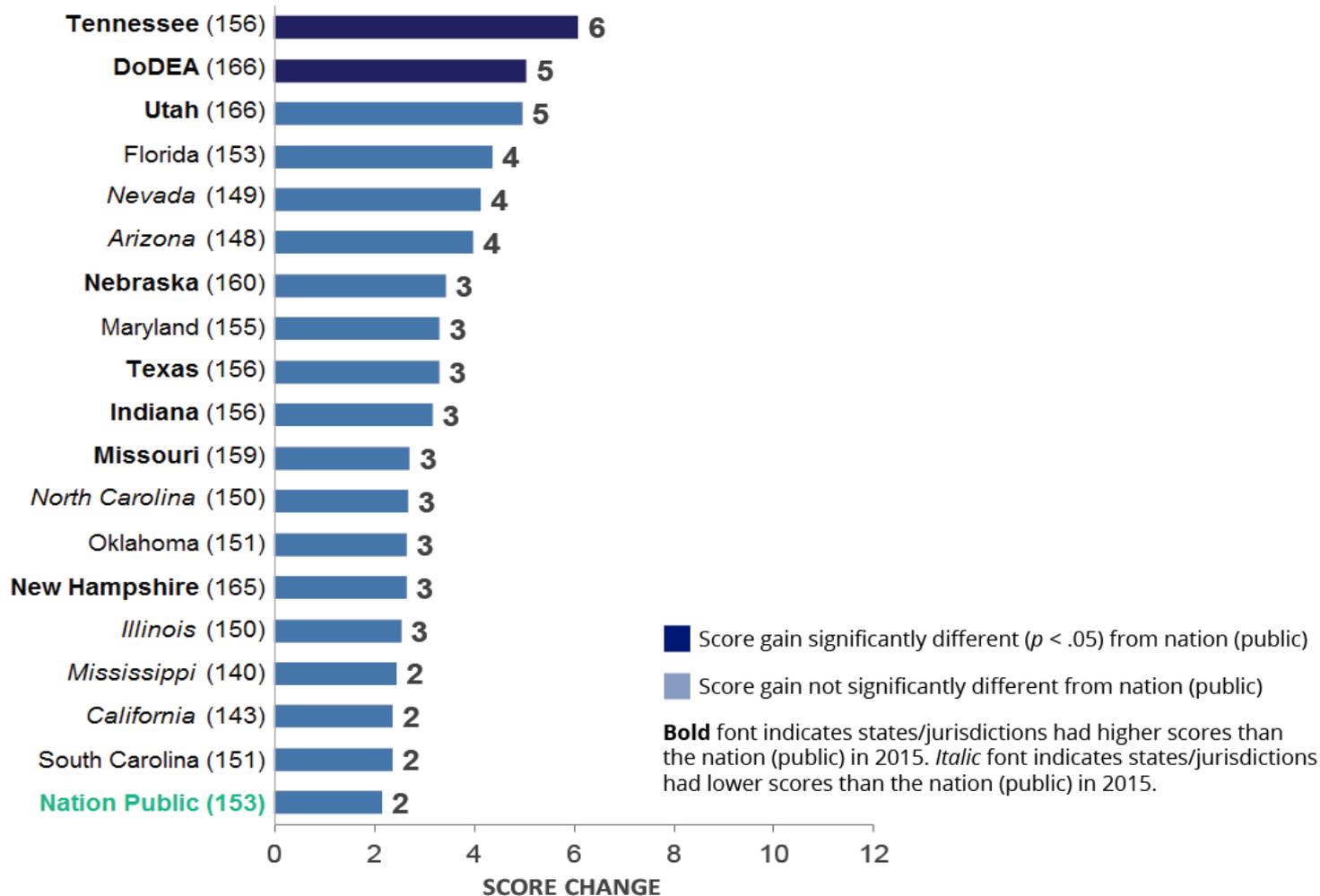


## Science scores increased in 12 states/jurisdictions and decreased in 1 state compared to 2011

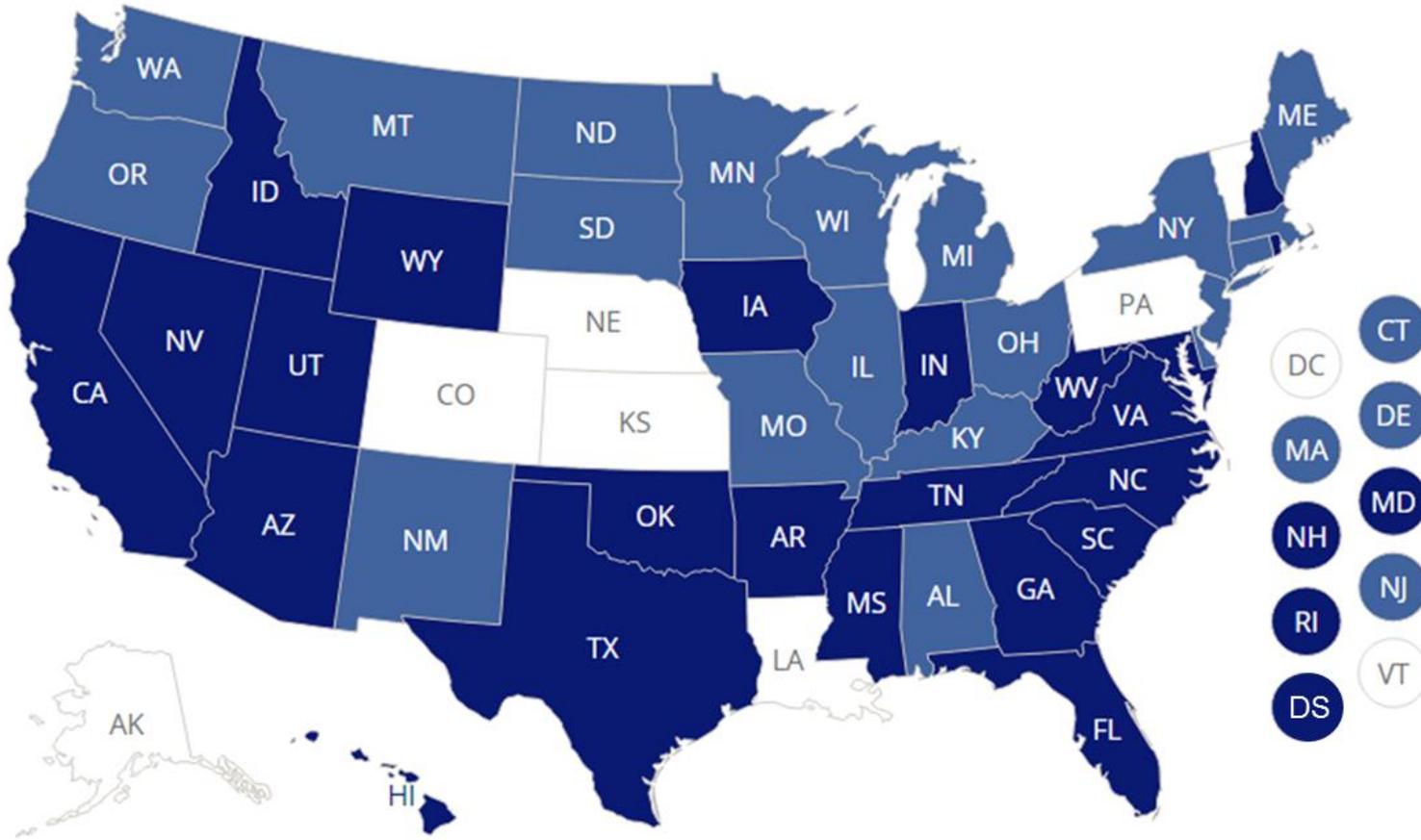


NOTE: DS = Department of Defense Education Activity (DoDEA).

## Two states/jurisdictions had greater score gains than the nation since 2011



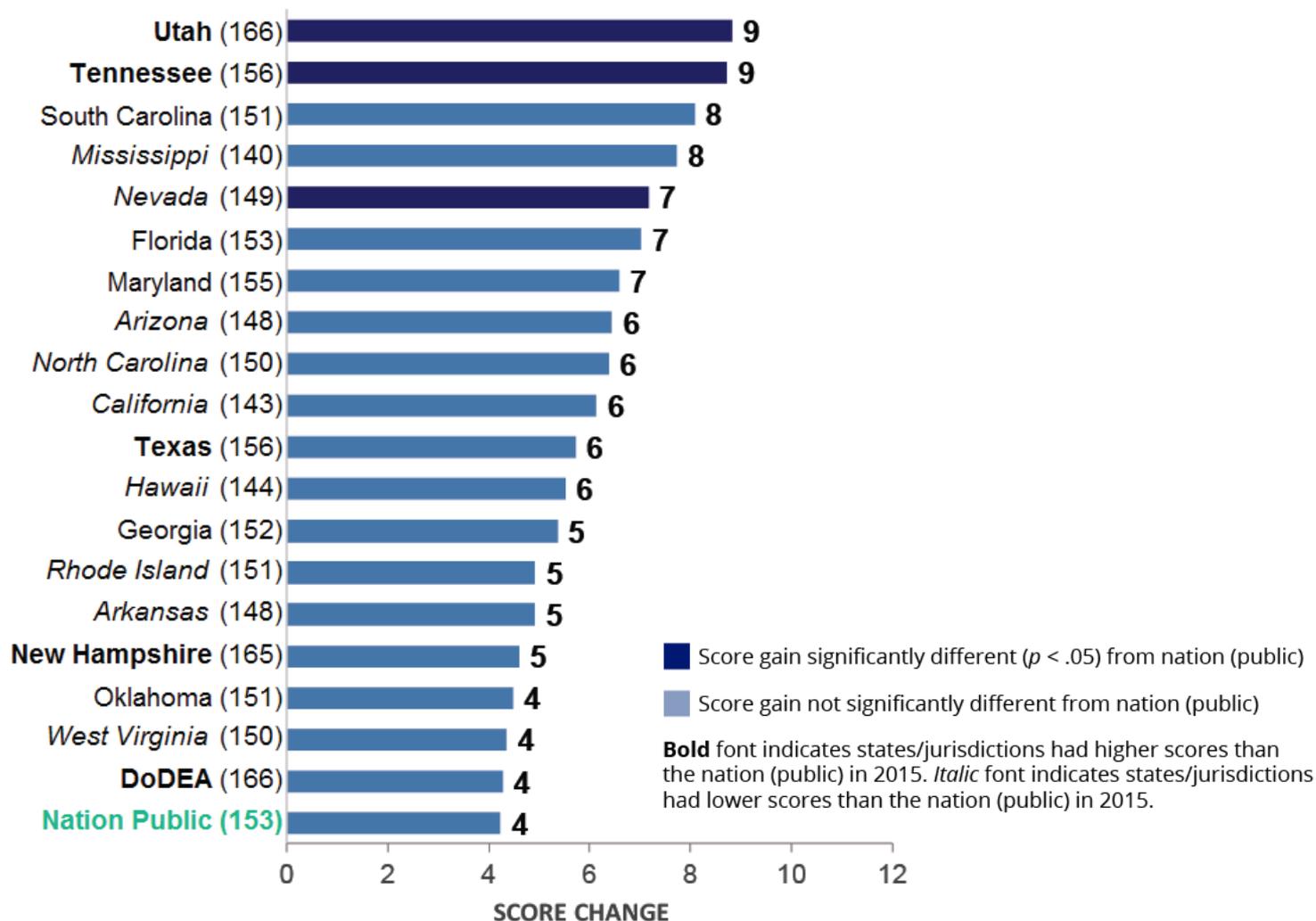
## Science scores increased in 24 states/jurisdictions and decreased in none compared to 2009



Score gain
  No significant score change
  No data/not applicable

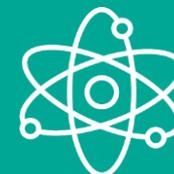
NOTE: DS = Department of Defense Education Activity (DoDEA).

## Three states had greater score gains than the nation since 2009



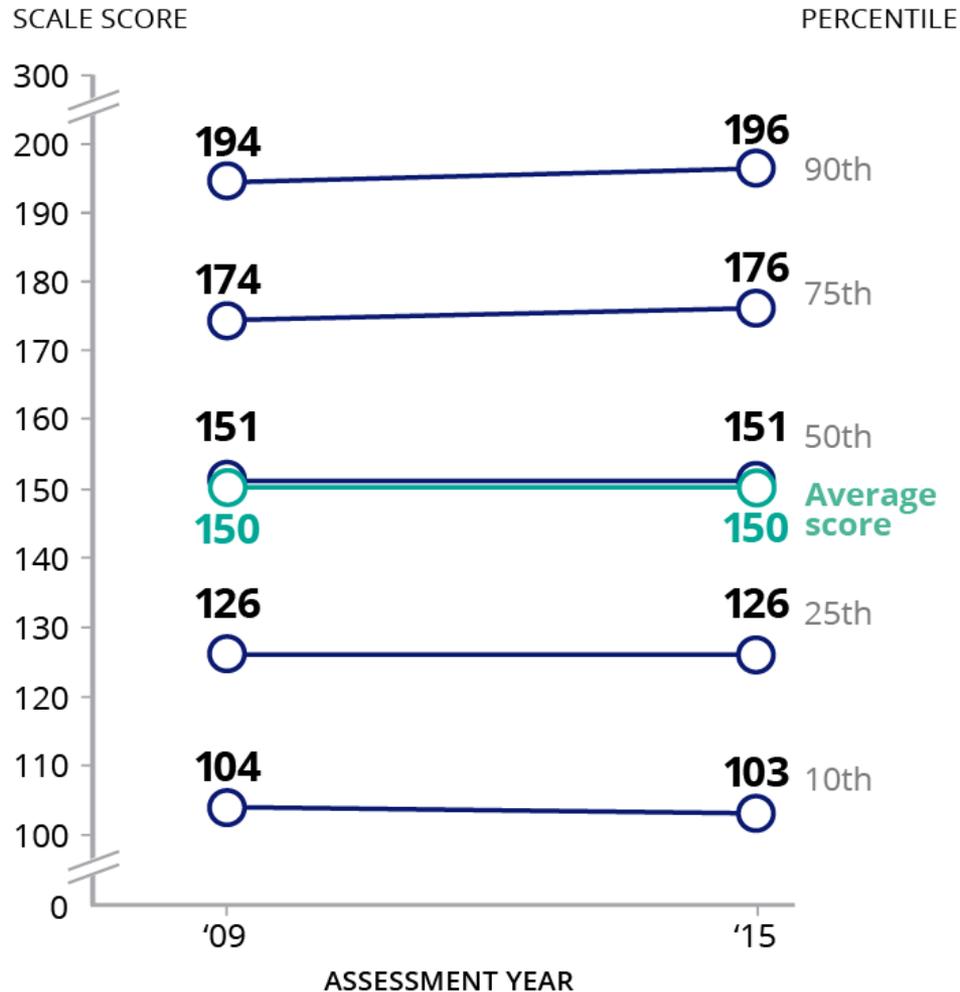
## Scores increased from 2009 to 2015 in 15 states/ jurisdictions at both grades 4 and 8

	Grade 4 only	Grade 8 only	Both grades	
↑ Score increase	Illinois Michigan Washington	California Idaho Iowa Maryland Nevada New Hampshire Rhode Island Virginia West Virginia	Arizona Arkansas Florida Georgia Hawaii Indiana Mississippi North Carolina Oklahoma	South Carolina Tennessee Texas Utah Wyoming DoDEA
↓ Score decrease	Delaware			

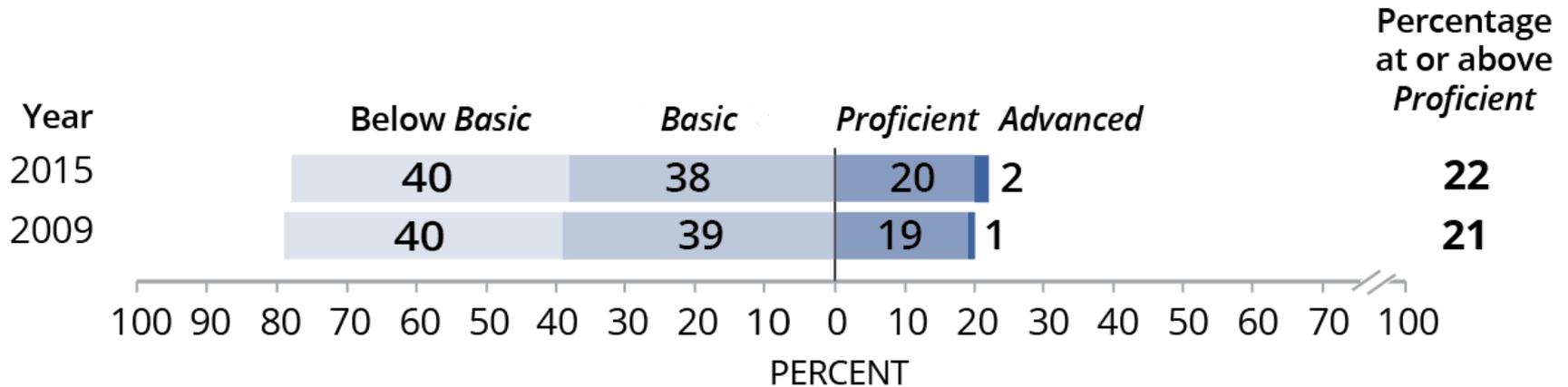


# Grade 12 Science Results

## Twelfth-grade average score no different than 2009



## Percentage at or above *Proficient* not significantly different than 2009



NOTE: Detail may not sum to totals because of rounding. The percentage comparisons are based on unrounded numbers rather than the rounded numbers shown in the graphic.

## Sample Question: Earth and Space Sciences

The picture on the right shows a rock formation with folded layers.

ROCK FORMATION



© travelib europe/Alamy, #A5DWTH

Which statement best explains how the rock layers folded?

- (A) The rock melted and flowed downhill.
- (B) The rock was deformed by a meteorite impact.
- (C) The rock was suddenly pulled apart during an earthquake.
- (D) The rock was slowly compressed due to tectonic plate movement.

## Twelfth-grade average scores in all content areas did not change compared to 2009

Content area	2015	2009
Physical science	150	150
Earth and space sciences	151	150
Life science	151	150

## No change in scores for most student groups since 2009

Student group	Average score in 2015	Score change from 2009
<b>All students</b>	<b>150</b>	◆ #
<b>Race/ethnicity</b>		
White (56%)	160	◆ 1
Black (14%)	125	◆ #
Hispanic (21%)	136	◆ 2
Asian/Pacific Islander (6%)	166	◆ 2
American Indian/Alaska Native (1%)	135	◆ 9
Two or More Races (2%)	156	◆ 5
<b>Gender</b>		
Male (51%)	153	◆ #
Female (49%)	148	◆ #

# Rounds to zero.

NOTE: Student group percentages in 2015 are shown in parentheses. The NAEP science scale ranges from 0–300.

◆ No significant change

## No change in scores for most student groups since 2009

Student group	Average score in 2015	Score change from 2009
<b>All students</b>	<b>150</b>	◆ #
<b>School location</b>		
City (29%)	145	◆ 1
Suburb (41%)	153	◆ 1
Town (11%)	150	◆ #
Rural (19%)	152	◆ 2
<b>Highest level of parental education</b>		
Did not finish high school (9%)	131	◆ #
Graduated high school (17%)	136	◆ 2
Some education after high school (21%)	148	◆ 1
Graduated college (49%)	162	◆ 1

# Rounds to zero.

NOTE: Student group percentages in 2015 are shown in parentheses. The NAEP science scale ranges from 0–300. Parental education “unknown” category is not shown.

◆ No significant change

## No change in scores for most student groups since 2009

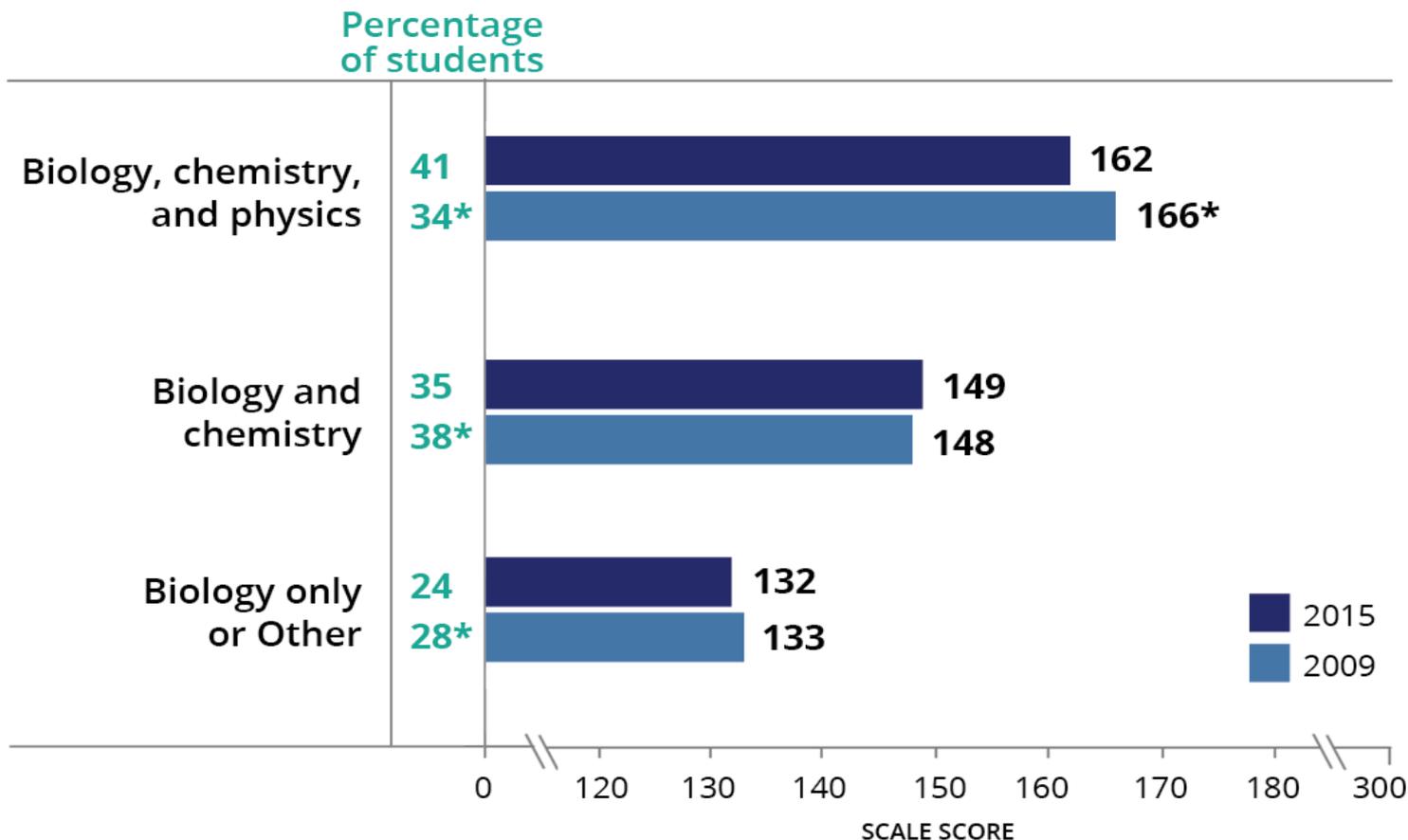
Student group	Average score in 2015	Score change from 2009
<b>All students</b>	<b>150</b>	◆ #
<b>Status as students with disabilities (SD)</b>		
SD (10%)	124	◆ 2
Not SD (90%)	153	◆ 1
<b>Status as English language learners (ELL)</b>		
ELL (3%)	105	◆ 1
Not ELL (97%)	152	◆ #

# Rounds to zero.

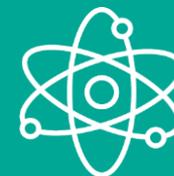
NOTE: Student group percentages in 2015 are shown in parentheses. The NAEP science scale ranges from 0–300.

◆ No significant change

**In 2015, twelfth-graders who reported taking courses in biology, chemistry, and physics since eighth grade scored lower compared to 2009**



\* Significantly different ( $p < .05$ ) from 2015.

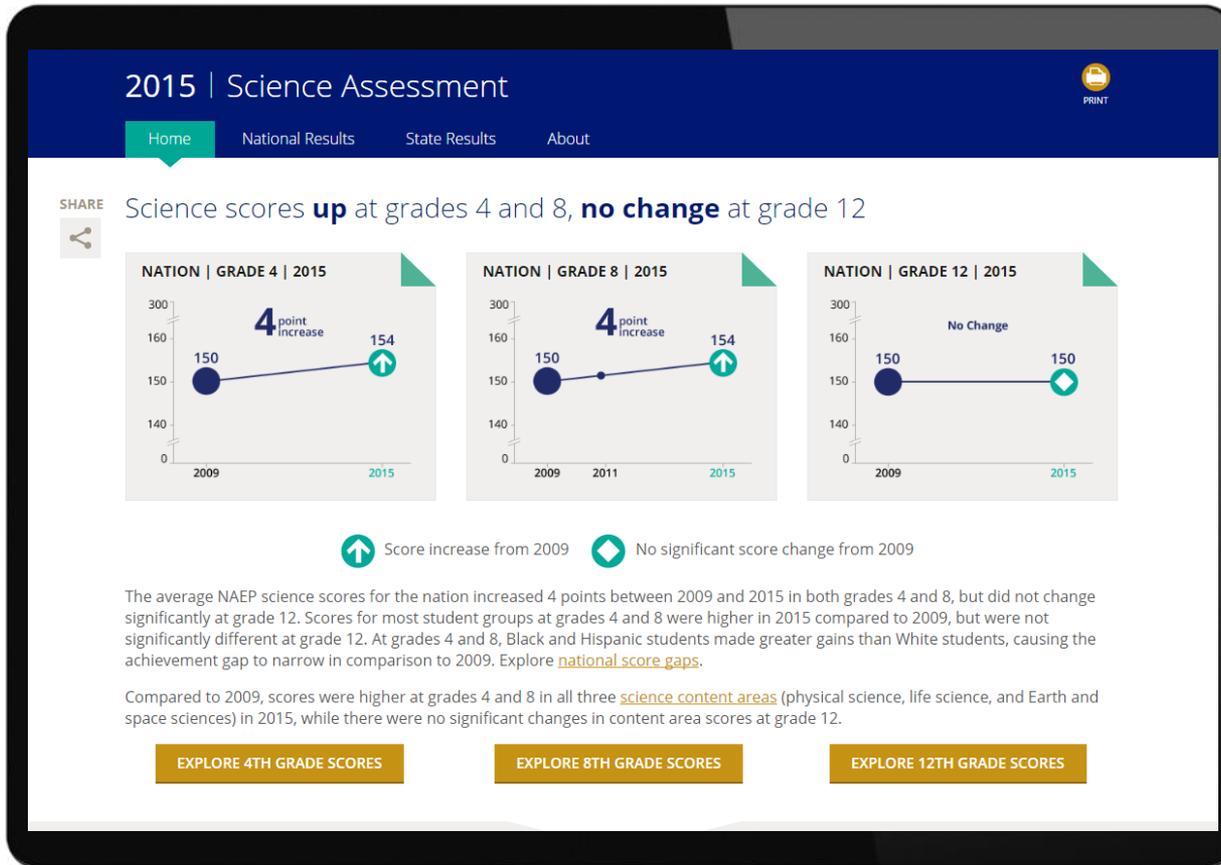


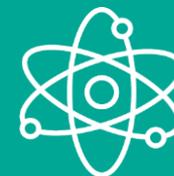
# Summary

## Nationally in 2015

- Score gains made at grades 4 and 8 since 2009; no change at grade 12
- Score gain also made at grade 8 since 2011
- Percentages at or above *Proficient* higher at grades 4 and 8 since 2009 and at grade 8 since 2011
- White–Black, White–Hispanic achievement gaps narrowed at both grades 4 and 8 compared to 2009
- Gender score gap remains at grades 8 and 12; no difference between male and female student scores at grade 4

## Explore the results online <http://nationsreportcard.gov>





# Questions?