



**Maryland**

STATE DEPARTMENT OF EDUCATION

# Annual Survey Report of Science Teachers

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Office of Teaching and Learning Instructional Programs and Services

January 2024

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**MARYLAND STATE DEPARTMENT OF EDUCATION**

**Carey M. Wright, Ed.D.**

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Deputy State Superintendent  
Office of Teaching and Learning

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Assistant State Superintendent  
Division of Assessment, Accountability and Performance Reporting

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## Table of Contents

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Introduction .....	3
Elementary School Science .....	4
Middle School Science .....	8
High School Science.....	10
Secondary Teacher Certification .....	12

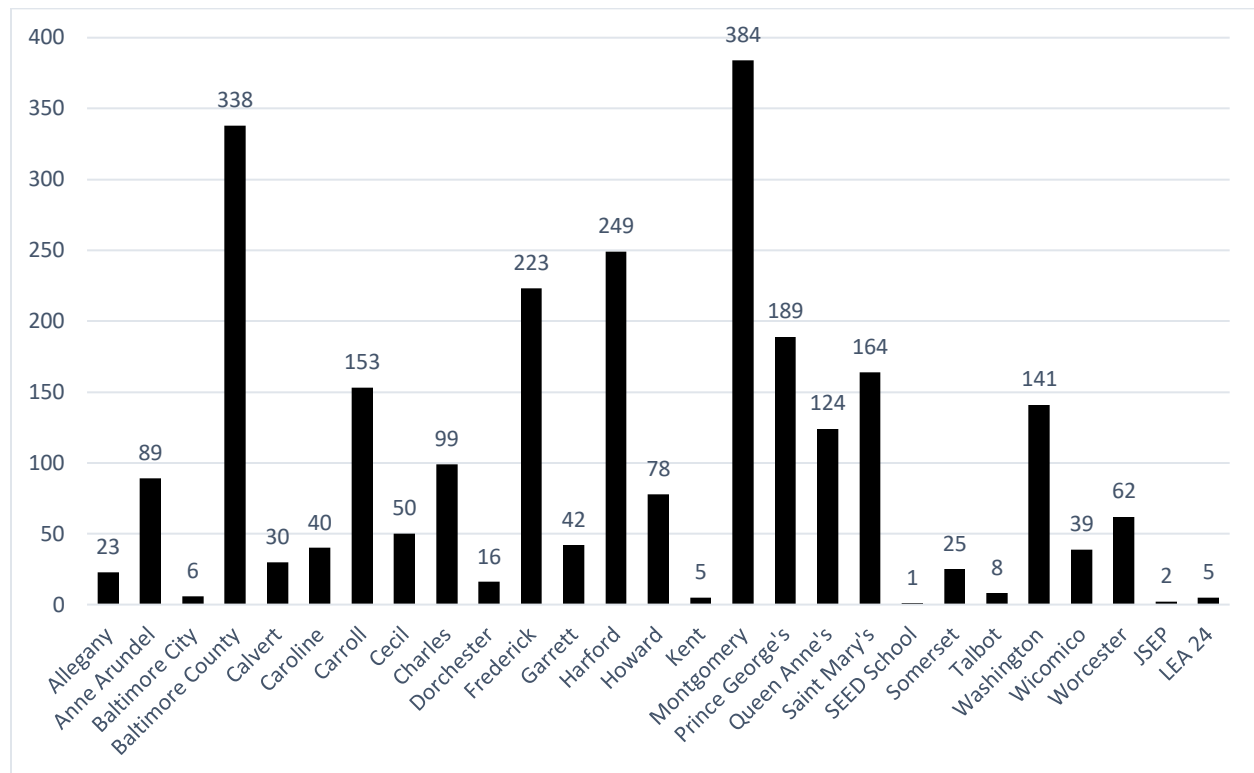
## Introduction

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**Section 7-203(e) of the Education Code of the Annotated Code of Maryland requires the Maryland State Department of Education (MSDE) to survey a statewide, representative sample of public schools and public school teachers annually to measure the amount of instructional time spent on social studies and science instruction in elementary schools, the availability and use of appropriate instructional resources and teaching technology in social studies and science classrooms; the availability and use of appropriate professional development for social studies and science teachers; and the number of secondary school social studies and science classes that area taught by teacher who are certified in the subject being taught and not certified in the subject being taught.**

In accordance with this requirement, the 2023 Annual Survey of Science and Social Studies Teachers was opened on October 16, 2023, and accepted responses until November 27, 2023. The survey collected 3,923 responses, with 51.4% of respondents identifying themselves as teachers in elementary schools, 23.9% identifying themselves as teachers in middle school, and 24.5% identifying themselves as teachers in high schools. Respondents identified themselves as educators within each of Maryland's twenty-four local education agencies (LEA) including several LEA 24 schools and the SEED School of Maryland.

2,590 of the total survey respondents identified themselves as science teachers. Of these respondents, 1,620 (62.6%) identified that they taught science in elementary schools, compared to 443 (17.1%) who identified that they taught science in middle schools and 527 (20.4%) who identified that they taught science in high schools. Similar to the respondent trend of the overall survey, science teacher respondents identified themselves as educators within each of Maryland's twenty-four local education agencies (LEA) including several LEA 24 schools and the SEED School of Maryland.

**Figure 1: Number of Science Teacher Responses by LEA**

This report provides an analysis of the responses related to science instruction in Maryland and is organized by school level beginning with elementary school.

## Elementary School Science

Elementary teacher respondents provided information about the amount of time dedicated to teaching science along with information about instructional methods, instructional resources, technology resources, and professional learning. 1,620 respondents indicated that they taught science in elementary schools.

To describe science instruction at the elementary level, the survey asked teachers to indicate the instructional model employed in their current teaching assignment. For the survey, the models were either **departmentalized** or **integrated**.

- Departmentalized – Teachers are assigned to teach either science or social studies.
- Integrated – Teachers are assigned to teach both science and social studies.

Most respondents (90.9% or 1,473) reported they teach science in elementary schools that use an integrated instructional model. The balance of respondents (9.1% or 147) reported teaching science in a departmentalized model.

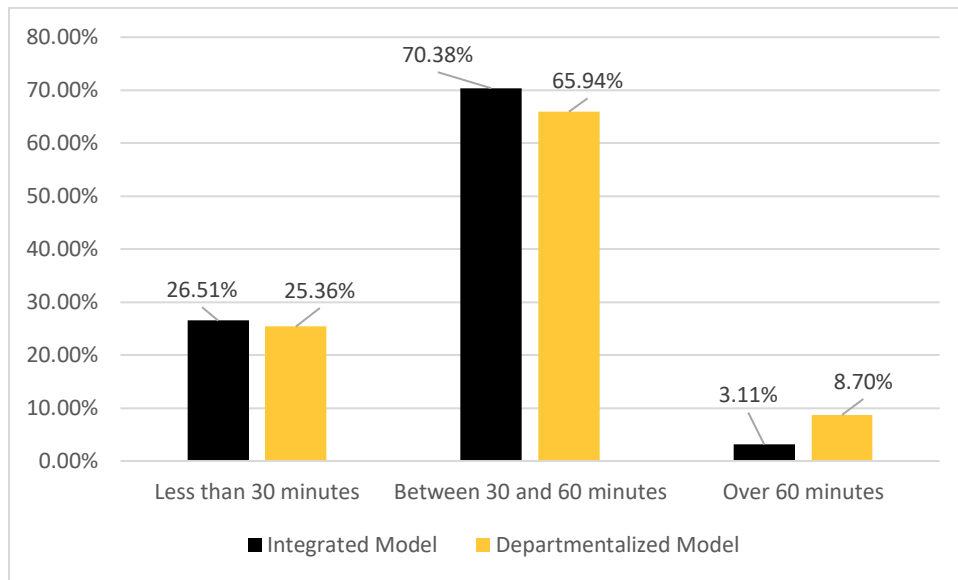
The data for each reporting category are disaggregated based on this organizational distinction.

### Instructional Time

To understand the amount of time available for elementary students to learn science, the survey asked elementary teachers to provide estimates on the approximate number of minutes and number of days for science instruction.

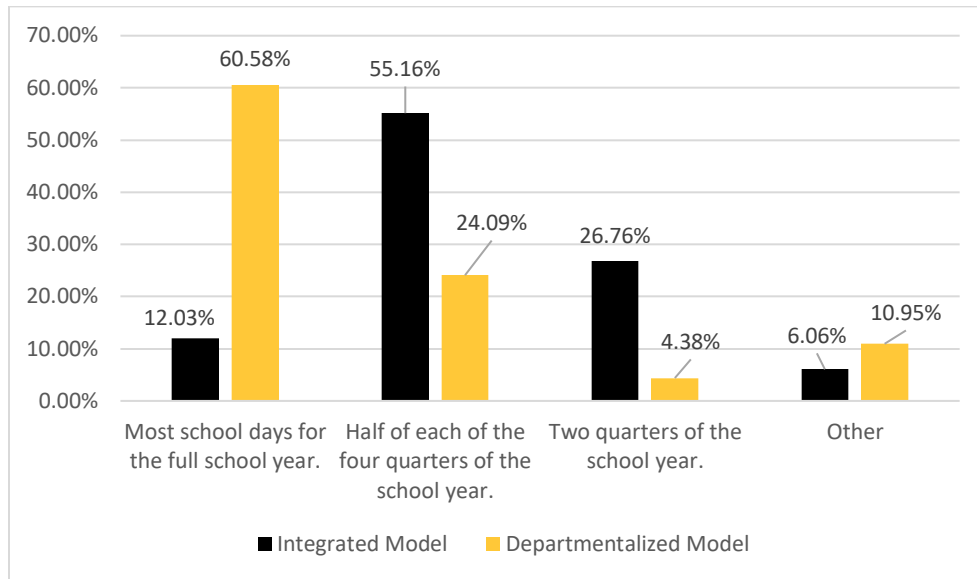
The majority of respondents from both departmentalized (65.9%) and integrated (70.4%) models report spending between 30 and 60 minutes on science instruction when science is taught.

**Figure 2: Number of Minutes for Science Instruction**



The number and distribution of days for science instruction differ across the two organizational models. Students attending schools using the departmentalized model were more likely to engage in science instruction during most days of the school year. Conversely, students attending schools where the integrated model is in use were more likely to engage in science instruction for about half of the days of the school year.

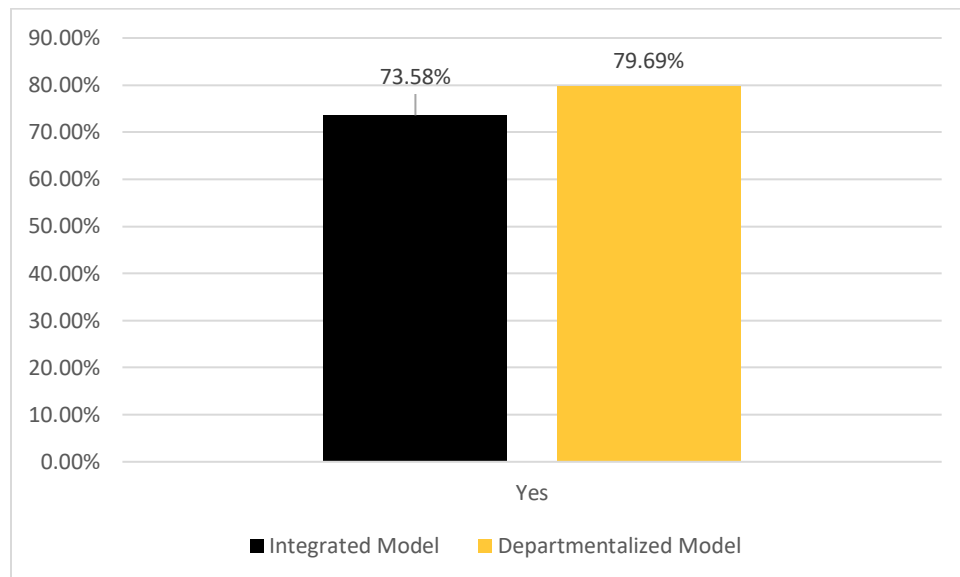
**Figure 3: Days Allotted to Science Instruction**



**Instructional Materials and Methods**

Science instruction is resource intensive, and it is important that students have access to appropriate materials to engage actively in science experiences. The survey asked respondents to indicate whether they had adequate access to laboratory and safety materials for student use when learning science. Over 79% of teachers in departmentalized schools and over 73% of teachers in integrated model schools reported adequate access to resources for laboratory investigations.

**Figure 4: Elementary School Respondents’ Perceptions of Resource Adequacy**



The survey also asked respondents to indicate the types of materials they use with students. The most commonly reported materials among elementary respondents were:

- District created materials
- Hands-on manipulatives
- Science kits

- Digital tools such as science videos, simulations, and animations.

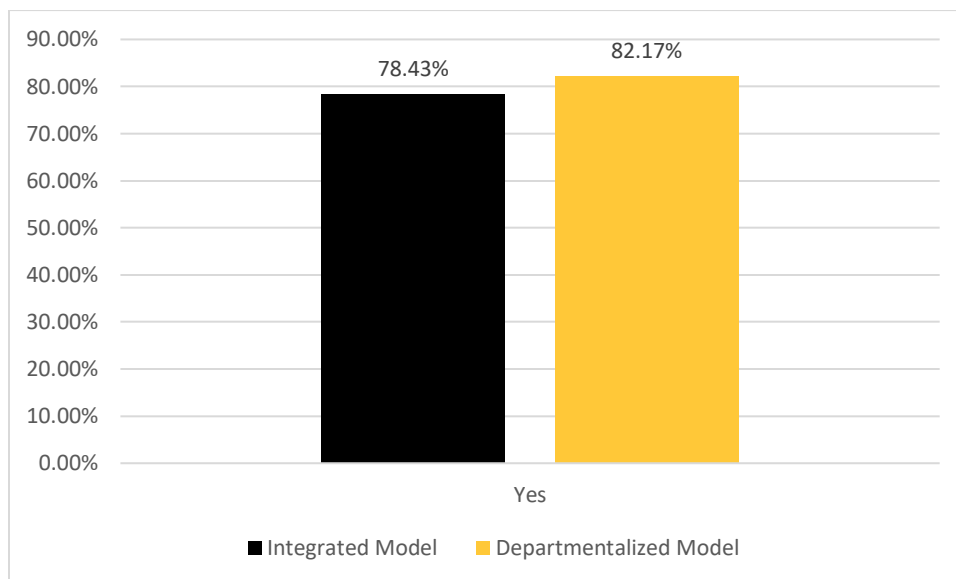
### Instructional Technology

The survey asked respondents to indicate the types of instructional technology available for their use when teaching science. Elementary teachers report using a variety of instructional technologies. Among the most frequently cited were document cameras, teacher computers with projectors, and interactive displays for large group presentations. School issued computers for students used both in and out of school were also frequently cited.

### Professional Learning

The survey asked respondents to indicate whether professional learning experiences specific to science were available to them. Most elementary level respondents confirmed they had access to science specific professional learning. Respondents in departmentalized schools reported slightly more access than respondents in schools using the integrated organizational model.

**Figure 5: Availability of Science Specific Professional Learning among Elementary Respondents**



The survey asked respondents to indicate the types of professional learning available to them. The most common type of professional learning reported by teachers was planning time with colleagues. District level science professional learning was also reported as a frequent source of professional learning.



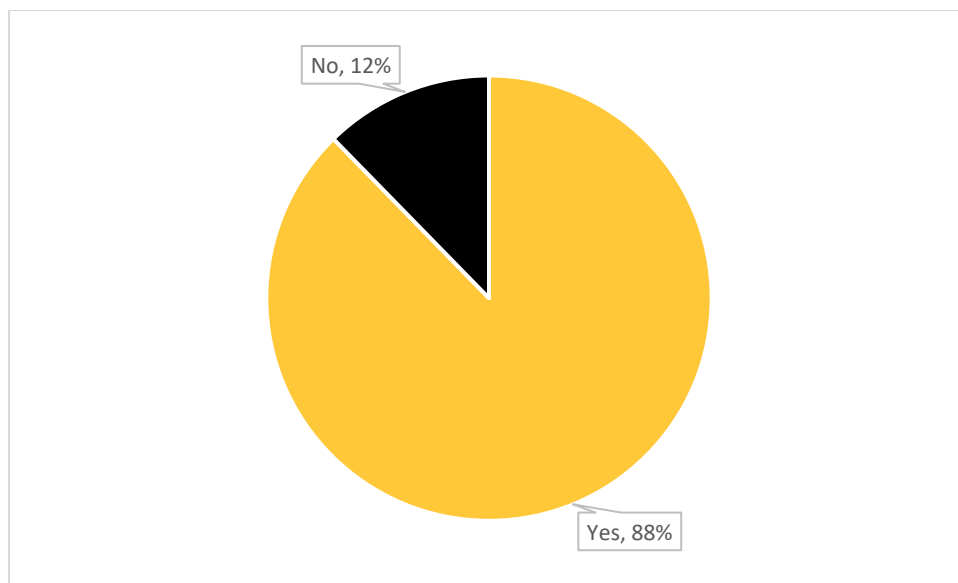
## Middle School Science

Middle school teacher respondents provided information about the availability and types of instructional resources, instructional technology, and science specific professional learning. 443 respondents identified themselves as middle school science teachers.

### Instructional Materials and Methods

The availability of instructional materials and safety equipment for students in middle school is fundamental to student learning. Nearly 88% of middle school respondents indicated that resources for laboratory investigations and safety were available for student use when learning science.

**Figure 6: Middle School Respondents' Perception of Resource Adequacy**



The most commonly reported materials in use were:

- Digital simulations
- Science videos
- Hands-on manipulatives
- Digital animations
- District created materials.

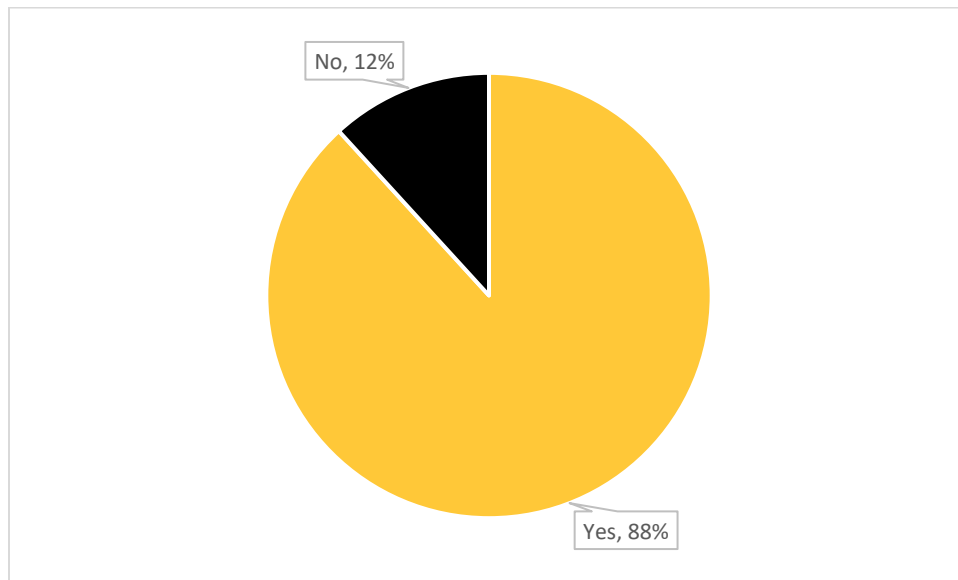
### Instructional Technology

Middle school teachers reported using a variety of instructional technologies with their students. School issued laptops, including Chromebooks and tablets, for use in and out of school were most commonly cited. Learning management systems, interactive displays for large group presentations, teacher computers with projectors, and document cameras were also frequently identified.

### Professional Learning

Most (88.2%) middle school science teachers reported access to science-specific professional learning.

**Figure 7: Availability of Science Professional Learning for Middle School Respondents**



The most common types of professional learning reported were planning time with colleagues in professional learning communities or teams and district level science professional learning.

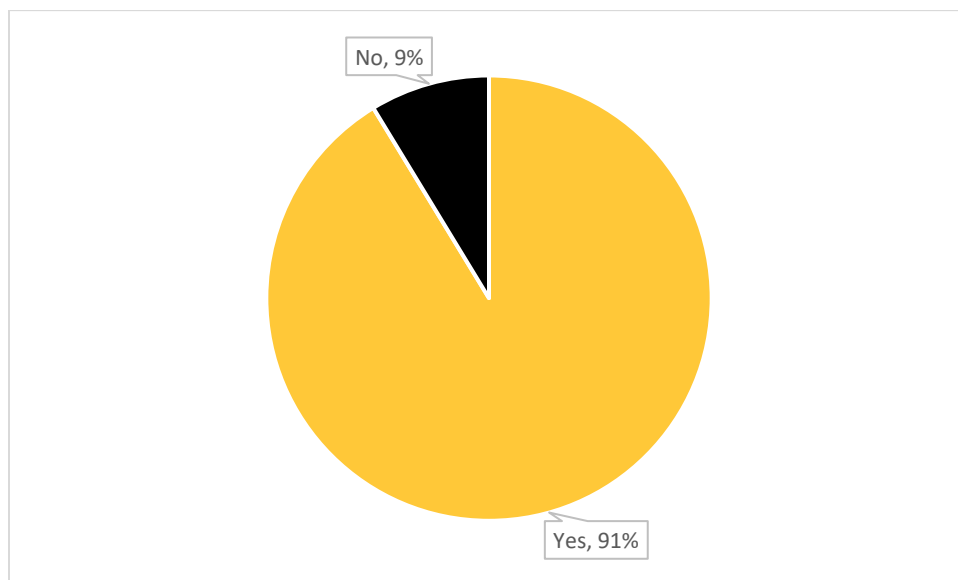
## High School Science

High school teacher respondents provided information about the availability and types of instructional resources, instructional technology, and science specific professional learning. 527 respondents identified themselves as high school science teachers.

### Instructional Materials and Methods

Students' access to instructional materials including laboratory and safety equipment in science remains critical in high school. Most high school respondents (91.3%) reported adequate access to instructional materials.

**Figure 8: High School Respondents' Perceptions of Resource Adequacy**



The most commonly used instructional materials were:

- Hands-on manipulatives
- Science videos
- Digital simulations and animations.

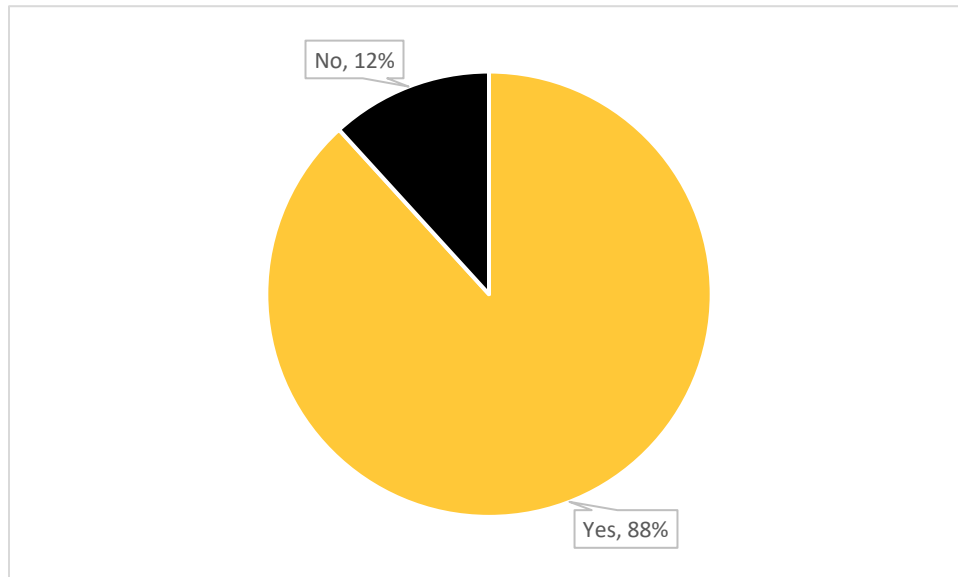
### Instructional Technology

High school teachers reported the use of school issued laptops, including Chromebooks and tablets, as the most frequently available instructional technology. Learning management systems, teacher computers with projectors, and the use of sensors and other probeware for data collection are also frequently in use. High school teachers reported document cameras as the fifth most frequently used technology.

### Professional Learning

Over 88% of high school science teachers report access to professional learning opportunities specific to science. The most frequently cited professional learning activity is planning time with colleagues such as in professional learning teams or communities. High school teachers also report access to district level science professional learning events.

**Figure 9: Availability of Science Specific Professional Learning for High School Respondents**



## Secondary Teacher Certification

At the secondary level, teachers hold certification in particular content areas. Their teaching assignments should correspond to their area of certification. Annually, each LEA reports the number of teachers at the secondary level who are teaching in-field and out-of-field.

- In-field means that the teacher is teaching a class that corresponds to the teacher's certification.
- Out-of-field means that the teacher is teaching a class that does not correspond to the teacher's certification.

Most teachers in each LEA teach within their field of certification. The following table shows the in-field and out-of-field certification status for science teachers in each LEA for the 2021-22 school year.

**Figure 10: Secondary Science Teacher Certification Status in School Year 2021-2022**

Local Education Agency	Teachers	In-Field	In-Field Percent	Out-of-Field	Out-of-Field Percent
Allegany	33.59	27.33	81.36	6.26	18.64
Anne Arundel	320.48	274.92	85.78	45.56	14.22
Baltimore City	305.58	264.67	86.61	40.92	13.39
Baltimore	518.58	382.10	73.68	136.48	26.32
Calvert	66.72	54.62	81.86	12.10	18.14
Caroline	25.46	18.67	73.33	6.79	26.67
Carroll	124.66	115.33	92.52	9.33	7.48
Cecil	70.28	63.81	90.79	6.47	9.21
Charles	101.00	101.00	100.00	0.00	0.00
Dorchester	21.35	17.75	83.14	3.60	16.86
Frederick	163.73	154.63	94.44	9.10	5.56
Garrett	20.03	20.03	100.00	0.00	0.00
Harford	165.05	135.70	82.22	29.35	17.78

<b>Local Education Agency</b>	<b>Teachers</b>	<b>In-Field</b>	<b>In-Field Percent</b>	<b>Out-of-Field</b>	<b>Out-of-Field Percent</b>
Howard	247.32	233.36	94.36	13.96	5.64
Kent	8.00	8.00	100.00	0.00	0.00
Montgomery	659.58	630.58	95.60	29.00	4.40
Prince George's	598.86	448.53	74.90	150.33	25.10
Queen Anne's	39.83	39.83	100.00	0.00	0.00
St. Mary's	68.50	63.50	92.70	5.00	7.30
SEED School	5.00	5.00	100.00	0.00	0.00
Somerset	15.61	14.98	96.00	0.63	4.00
Talbot	22.40	18.26	81.52	4.14	18.48
Washington	96.35	82.28	85.40	14.07	14.60
Wicomico	59.00	57.00	96.61	2.00	3.39
Worcester	31.34	31.34	100.00	0.00	0.00