MASSACHUSETTS DEPARTMENT OF
ELEMENTARY AND SECONDARY
EDUCATION

Release of Spring 2022 MCAS Test Information

from the

High School Technology/Engineering Paper-Based Test

July 2022
Massachusetts Department of Elementary and Secondary Education

MASSACHUSETTS DEPARTMENT OF
ELEMENTARY AND SECONDARY
EDUCATION

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High School Technology/Engineering Test

The spring 2022 high school Technology/Engineering test was a legacy assessment that was based on learning standards in the Technology/Engineering content strand of the October 2006 version of the *Massachusetts Science and Technology/Engineering Curriculum Framework*. The 2006 framework is available on the Department website at www.doe.mass.edu/frameworks/archive.html. Massachusetts adopted a new curriculum framework in science and technology/engineering in 2016. A plan for transitioning the MCAS assessments to the new framework is available at www.doe.mass.edu/mcas/tdd/sci.html?section=transition.

Technology/Engineering test results are reported under the following four MCAS reporting categories:

- Engineering Design
- Construction and Manufacturing
- Fluid and Thermal Systems
- Electrical and Communication Systems

The table at the conclusion of this document indicates each item's reporting category and the framework learning standard each item assesses. In order to support future test development, items from the spring 2022 Technology/Engineering test are not included in this publication. The omission of these items will have no impact on the reporting of results.

Test Sessions

The high school Technology/Engineering test included two separate test sessions. Each session included multiple-choice and open-response questions.

Reference Materials and Tools

Each student taking the high school Technology/Engineering test was provided with a plastic ruler and a Technology/Engineering Formula Sheet. A copy of this formula sheet appears on the following page. An image of the ruler is not reproduced in this publication.

Each student also had sole access to a calculator with at least four functions and a square-root key.

During both Technology/Engineering test sessions, the use of bilingual word-to-word dictionaries was allowed for current and former English learner students only. No other reference tools or materials were allowed.

Massachusetts Comprehensive Assessment System
Technology/Engineering Formula Sheet

Formulas

$V = I \times R$

$P = I \times V$

$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$

$\text{Area of a circle} = \pi r^2$

Variables

I = current

P = power

R = resistance

V = voltage

r = radius

Definitions and Abbreviations

AC = alternating current

DC = direct current

psi = pounds per square inch

$\pi \approx 3.14$

High School Technology/Engineering
Spring 2022 Unreleased Operational Items:
Reporting Categories and Standards

Item No.	Reporting Category	2006 Standard
1	*Construction and Manufacturing*	7.1
2	*Electrical and Communication Systems*	6.5
3	*Electrical and Communication Systems*	5.5
4	*Engineering Design*	1.1
5	*Construction and Manufacturing*	7.3
6	*Engineering Design*	1.3
7	*Electrical and Communication Systems*	5.4
8	*Electrical and Communication Systems*	6.4
9	*Construction and Manufacturing*	2.6
10	*Engineering Design*	1.5
11	*Electrical and Communication Systems*	5.3
12	*Construction and Manufacturing*	2.1
13	*Fluid and Thermal Systems*	3.5
14	*Electrical and Communication Systems*	5.5
15	*Fluid and Thermal Systems*	3.1
16	*Construction and Manufacturing*	2.4
17	*Fluid and Thermal Systems*	3.4
18	*Fluid and Thermal Systems*	3.3
19	*Construction and Manufacturing*	7.2
20	*Fluid and Thermal Systems*	4.3
21	*Engineering Design*	1.4
22	*Electrical and Communication Systems*	6.2
23	*Fluid and Thermal Systems*	4.2
24	*Fluid and Thermal Systems*	3.1
25	*Electrical and Communication Systems*	5.4
26	*Engineering Design*	1.3
27	*Engineering Design*	1.2
28	*Fluid and Thermal Systems*	4.1
29	*Engineering Design*	1.5
30	*Electrical and Communication Systems*	5.3
31	*Electrical and Communication Systems*	6.5
32	*Engineering Design*	1.4
33	*Construction and Manufacturing*	2.5
34	*Fluid and Thermal Systems*	3.2
35	*Fluid and Thermal Systems*	4.4
36	*Electrical and Communication Systems*	5.1
37	*Electrical and Communication Systems*	6.1
38	*Construction and Manufacturing*	2.2
39	*Construction and Manufacturing*	2.3

Item No.	Reporting Category	2006 Standard
40	*Electrical and Communication Systems*	5.3
41	*Electrical and Communication Systems*	6.3
42	*Fluid and Thermal Systems*	4.2
43	*Electrical and Communication Systems*	5.2
44	*Fluid and Thermal Systems*	3.4
45	*Engineering Design*	1.1