
MTEL®-Flex General Curriculum Subtest 2— Mathematics, Science, and Technology/Engineering (Objective 0020)

Objective 0020: Prepare an organized, developed analysis of a scenario that integrates science/engineering and mathematics content and practices.

Objective 0020 includes the following descriptive statements:

1. Analyze a description or model of a situation involving a scientific phenomenon, an investigation, or an engineering design problem.
2. Apply appropriate mathematical knowledge and skills to the given situation (e.g., to select appropriate units of measurement; to apply geometry concepts; to summarize, interpret, and/or analyze data; to model relationships with tables, graphs, and equations; to verify quantifiable data).

MTEL®-Flex enables you to demonstrate your functional content knowledge of the MTEL General Curriculum Subtest 2 test objectives through submitting materials on a scenario that you select. **You must develop a scenario that integrates science/engineering and mathematics content and practices. Your analysis of this scenario must address both descriptive statements listed above.**

Your submission will be evaluated on the extent to which you demonstrate the **depth of your subject matter knowledge** of the MTEL-Flex General Curriculum Subtest 2 Objective 0020.

MTEL-Flex General Curriculum Subtest 2 involves answering 5 prompts and writing an analysis in which you demonstrate your knowledge of the content assessed by the test objective and further elaborated by the required descriptive statements as you prepare an analysis of your stated scenario.

Your responses to the first 5 prompts should be **no more than 2 single-spaced pages** and your written analysis should be **no more than 3 single-spaced pages**. This instructions page does not count toward your page limits.

This template contains a [Prompt Section](#) and a [Written Analysis Section](#). Once both sections are completed, upload the template to the Pearson ePortfolio System.

For more information about the MTEL-Flex Assessment, preparing your materials for submission, and scoring of your submission, refer to the MTEL-Flex Assessment Handbook.

Prompt Section

Respond to the prompts below (**no more than 2 pages, including prompts**) by typing your responses in Arial 11-point, single-spaced font, within the brackets following each prompt. Do not delete or alter the prompts. Only the two pages will be evaluated. The previous page of instructions and the written analysis that follows do not count toward your page limit. Your submission cannot contain hyperlinks to any materials.

1. Indicate one mathematics domain and one science domain that you have selected from the lists below. You will need to be able to integrate the mathematics and science content you select.

Mathematics Domains	Science Domains
The Number System	Earth and Space Science
Ratios and Proportional Relationships	Life Science
Expressions and Equations	Physical Science
Functions	Technology/Engineering
Statistics and Probability	
Geometry	

[Mathematics Domain: Ratios and Proportional Relationships

Science Domain: Physical Science]

2. **Mathematics.** Indicate one or more content standards from within the same cluster heading for grades 6–8 from the [Massachusetts Mathematics Curriculum Framework – 2017](#) (pp. 54–71) that addresses your selected mathematics domain.

[6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship, including the use of units.

6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.]

3. **Science and Technology/Engineering.** Indicate a disciplinary core idea from one of the science domains (Earth and Space Science, Life Science, Physical Science, or Technology/Engineering) found in Appendix III of the [Massachusetts Science and Technology/ Engineering Curriculum Framework – 2016](#) (pp. 131–143) for grades 5–8 that addresses your selected science domain.

[PS1.A Structure of Matter (6-8) That matter is composed of atoms and molecules can be used to explain the properties of substances, diversity of materials, how mixtures will interact, states of matter, phase changes, and conservation of matter. States of matter can be modeled in terms of spatial arrangement, movement, and strength of interactions between particles. Characteristic physical properties unique to each substance can be used to identify the substance.]

4. Write a 1- to 3-sentence scenario for upper elementary students that **integrates** the mathematics content standard(s) and the science Disciplinary Core Idea you selected. The scenario you describe should be one that permits you to demonstrate the depth of your mathematics and science subject matter knowledge in the Written Analysis Section of the template.

[I will use graphs and rates of change to describe how a pot holding a mixture of water and ice changes in temperature as it is slowly heated to boiling by a hotplate. I will focus

on how temperature changes when ice melts, water warms, and boiling begins. I will ask students to explain these changes using a particle model and predict how different substances might behave in the same situation.]

5. List any additional sources used to prepare your submission.

[Brown, T.E., Lemay, H.E., Bursten, B.E., Murphy, C.M., Woodward, P., & Stoltzfus, M.E. (2022). *Chemistry: The Central Science*. (15th ed.). Pearson.

Hewitt, P.G., Lyons, S.A., Suchocki, J.A., & Yeh, J. (2019) *Conceptual Integrated Science*. (3rd ed.). Pearson.

Lial, M. L., Salzman, S. A., & Hestwood, D. L. (2017). Basic College Mathematics (10th ed.). Pearson Education (US). <https://pearsonid.vitalsource.com/books/9780134474151>]

Written Analysis Section

Type your analysis (**no more than 3 pages, including the prompt**) in Arial 11-point, single-spaced font, within the brackets following the prompt. If appropriate, you may include tables, charts, graphs, or other diagrams that you have prepared by inserting them into your analysis. However, the total length of your analysis, including any graphic elements, may not exceed 3 pages. The previous pages of instructions and prompts do not count toward your page limit. Your submission cannot contain hyperlinks to any materials.

Prepare an organized, developed analysis of the scenario described in the Prompt Section to demonstrate the depth of your subject matter knowledge. In your analysis make sure to:

1. Analyze a description or model of a situation involving a scientific phenomenon, an investigation, or an engineering design problem.
2. Apply appropriate mathematical knowledge and skills to the given situation (e.g., to select appropriate units of measurement; to apply geometry concepts; to summarize, interpret, and/or analyze data; to model relationships with tables, graphs, and equations; to verify quantifiable data).

[Analysis text here; can go up to page 3 of 3...]