
NYSTCE Flex Multi-Subject: Secondary Teachers (Grade 7–Grade 12) Template

Template Contents

This template for NYSTCE Flex Multi-Subject: Secondary Teachers (Grade 7–Grade 12) Part Two: Mathematics (NYSTCE Flex Multi-Subject 7–12 Math) contains the following sections:

- [Competency 0004](#)
- [Template Instructions](#)
- [Prompt Section](#)
- [Written Analysis Section](#)

Part Two: Mathematics Competency 0004: Analysis, Synthesis, and Application

Competency 0004 from the NYSTCE Multi-Subject: Secondary Teachers (Grade 7–Grade 12) Framework includes the following performance expectations and performance indicators:

Performance Expectations

The New York State Grade 7–Grade 12 Multi-Subject teacher accurately and effectively applies relevant foundational content knowledge and pedagogical content knowledge (e.g., number and operations, operations and algebraic thinking, ratio and proportional reasoning, measurement and data) to analyze and synthesize assessment data about an individual student, identify conceptual or procedural errors, and provide a well-reasoned and accurate analysis of a student's mathematical knowledge. The teacher uses the assessment results and knowledge of how students learn to present an appropriate instructional approach that meets the needs of the student.

Performance Indicators

- a. analyzes and interprets samples of a student's work and other assessment data to monitor student progress and determine a student's strengths and areas of need in mathematics
- b. demonstrates knowledge of the content by identifying and analyzing any errors or misconceptions in work samples
- c. describes appropriate and effective content-specific instructional strategies, activities, or interventions to address a student's identified needs
- d. demonstrates the ability to generate real-world scenarios that illustrate specific mathematical concepts
- e. demonstrates the ability to justify the effectiveness of selected instructional strategies, activities, or interventions for promoting a student's mathematical understanding

Template Instructions

NYSTCE Flex Multi-Subject 7–12 Math enables you to demonstrate your functional content knowledge of NYSTCE Field 244 Multi-Subject: Secondary Teachers (Grade 7–Grade 12) Part Two: Mathematics Competency 0004 by submitting materials on the following scenario:

You will describe an assignment that aligns with a Grade 7–Grade 12 New York State Next Generation Mathematics Learning Standard. The assignment can be from a lesson you have delivered or from a planned lesson you may deliver in the future. It should include actual or simulated examples of student thinking that reflect the strengths and areas of need of a student who is learning information, concepts, and skills from the learning standard. The assignment should allow you to demonstrate depth in your understanding of content and instruction related to the learning standard. You will give evidence of your understanding by analyzing student thinking developed as a response to the assignment and then recommending an instructional intervention based on this response.

Your submission will be evaluated on the extent to which you demonstrate the **depth of your content knowledge** of NYSTCE Field 244 Multi-Subject: Secondary Teachers (Grade 7–Grade 12) Part Two: Mathematics Competency 0004.

NYSTCE Flex Multi-Subject 7–12 Math involves responding to 5 prompts and writing an analysis in which you demonstrate your knowledge of the content assessed by the test competency.

Your responses to the first 5 prompts should be **no more than 6 single-spaced pages of written text and graphics**. Your written analysis should be **no more than 3 single-spaced pages**. The competency text and template instructions do not count toward your page limits.

After you complete both the [Prompt Section](#) and the [Written Analysis Section](#), you will upload this completed template to the Pearson ePortfolio System.

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

Prompt Section

Referring to the scenario on the previous page, respond to the prompts below (**no more than 6 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. The previous pages of competency text and instructions as well as the written analysis that follows do not count toward your page limit. Your submission cannot contain hyperlinks to any materials. Responses to all prompts are required, but only your written analysis will be evaluated.

1. **Background Information about the Learning Standard:** Indicate a grade level, a domain, a cluster heading within the selected domain, and one or more content standards within the selected cluster for grade 7, grade 8, Algebra I, Geometry, Algebra II, or Plus (+) from the [NYS Next Generation Mathematics Learning Standards](#) (pp. 108–168).

Grade Level: [High School, Algebra I]

Domain: [AI-F.IF, Interpreting Functions]

Cluster: [Interpret functions that arise in applications in terms of the context.]

Standard: [Standard 4: For a function that models a relationship between two quantities:

- interpret key features of graphs and tables in terms of the quantities; and
- sketch graphs showing key features given a verbal description of the relationship.

Standard 6: Calculate and interpret the average rate of change of a function over a specified interval]

2. **Background Information about Student Learning:** Describe any skills or concepts that students have previously learned or have recently been studying that are related to the learning standard. If you are focusing on a planned lesson, describe related skills and concepts on which you would plan to provide instruction prior to the lesson. The purpose of this information is to describe concepts, skills, and knowledge students can use as they complete an assignment (to be introduced in the response to Prompt #3) and may be further developed as they progress toward its instructional goal. Refer to the study guide and the sample completed template for examples of appropriate background information tasks to include.

[Students have recently worked with functions shown as stories, tables, graphs, and equations. They can identify independent and dependent variables, label axes with quantities and units, and choose a reasonable domain and range for a real situation. Students have practiced reading key graph features, such as intercepts, regions of increase and decrease, relative maxima and minima, and end behavior. They have also found and interpreted average rate of change from tables and graphs.]

3. **Description of Assignment:** Describe an assignment that aligns with the learning standard and supports a major instructional goal. The assignment can be part of a previously delivered lesson or part of a planned lesson, as noted above. Examples of assignments can include, but are not limited to, conceptual tasks, applications of mathematical modeling, word problems, numeric and algebraic representations, and manipulatives. The assignment should be effective in revealing students' strengths and areas for improvement in the selected standard, and it should also allow a teacher to use this information to develop academic intervention activities to support student learning. Your description of the

assignment should primarily focus on instructional content; nonessential information related to its implementation (e.g., potential accommodations, grading criteria, expected implementation time) should not be included. The task should represent a substantial mathematics assignment, with opportunities for students to develop and describe a mathematical argument. Refer to the study guide and the sample completed template for examples of activity descriptions.

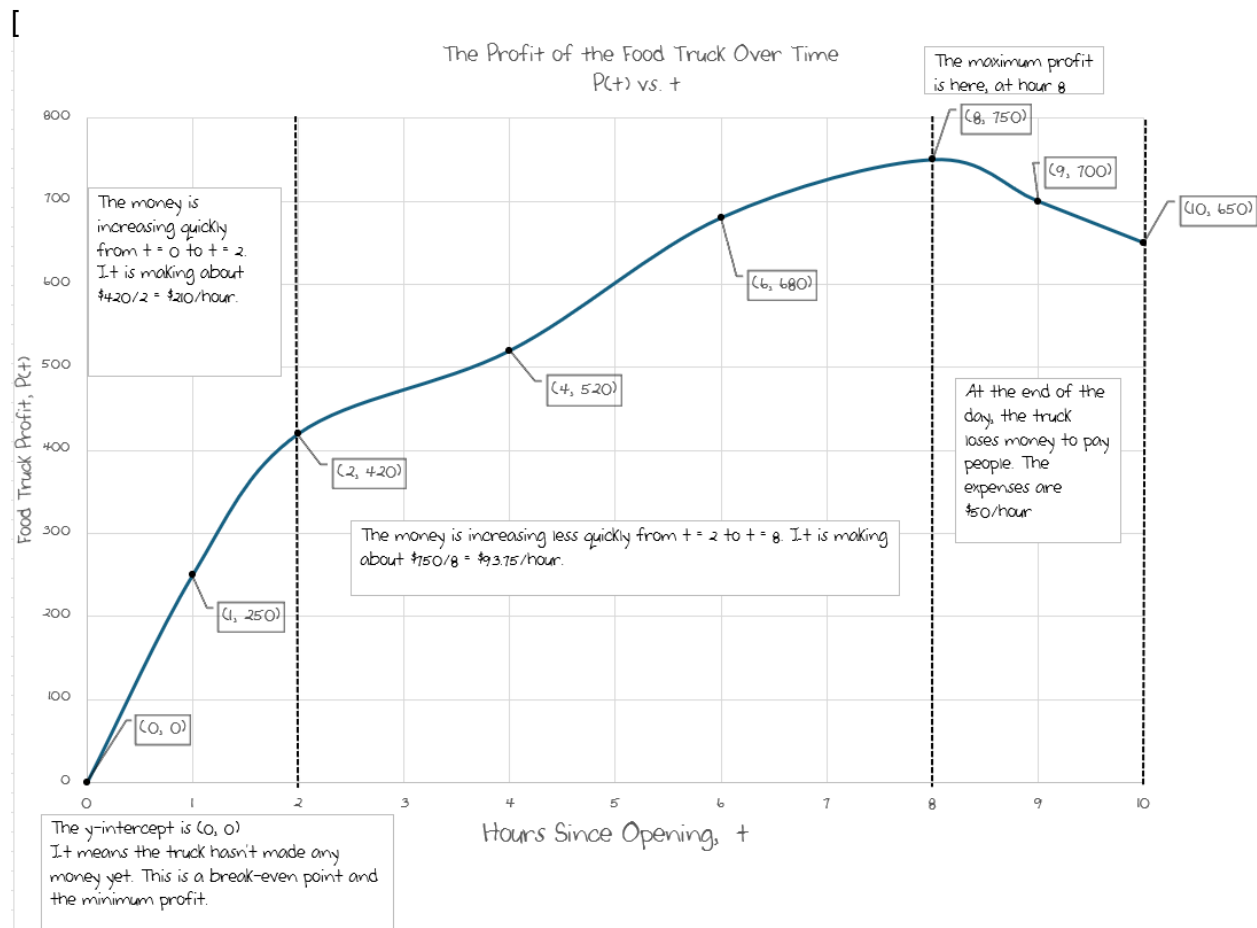
[Assignment: Interpreting and Sketching a Function for a Food Truck at a Street Festival
A local food truck sets up near a festival. Let t be the number of hours since the truck opens, and let $P(t)$ be the truck's total profit in dollars. You will sketch, label, and interpret a function that could represent the total profit based on the following conditions:

- The truck pays for supplies and a permit before opening, so $(P(0))$ is negative.
- Right after opening there is a long line, and profit increases quickly at first.
- After the first rush, sales continue but slow down.
- Later, there is another rush of customers, and profit increases quickly again.
- The truck stops selling after 8 hours, but from $8 \leq t \leq 10$, the truck pays workers to clean up and prep for the next day, so profit decreases at a constant rate during this time.

Student tasks:

1. Draw a graph of total profit, $P(t)$ (in dollars), versus time, t (in hours), for $0 \leq t \leq 10$. Label the axes and units. Plot and label at least 6 points on your graph, including $t = 0$, $t = 8$, and $t = 10$. Plot the points on your graph.
2. Label key features: On the graph, label the y-intercept, any break-even points, and the maximum and minimum profit.
3. Using your table, calculate the average rate of change on:
 - one "fast increase" interval,
 - one "slow increase" interval, and
 - the cleanup interval.
4. Write a short paragraph explaining why your graph makes sense for the situation. Use at least three labeled features and at least one of your average rates of change in your explanation.]

4. **Sample Student Response:** Present a completed example of student work on the assignment that provides evidence of at least one mathematical strength and one area of need related to the lesson's topic. This can be an actual student work sample from a lesson you have delivered, or a sample created by you that represents anticipated student work for a planned lesson. The student response may include, but is not limited to, a summary or an excerpt of a student discussion; work performed for an exit ticket or a formative assessment; calculations, expressions, equations, drawings, and other student-created representations; and written text. The response may include images, and it should represent student thinking from a previously delivered or planned lesson. Refer to the study guide and the sample completed template for examples of work samples.



My graph matches the story because it starts at 0 when they open and then increases fast because it's busy. They are making about \$210 per hour after they start. Then it increases more slowly after two hours. Later, it increases again. If they make \$750 at hour 8, it's like they are making \$93.75 during this time because that is the average rate of $\$750 \div 8$. At the end it goes down because they have to pay for cleanup for the last 2 hours. I made it be \$50 per hour since that is like paying two people \$25 per hour to clean up.]

NOTE: In the Written Analysis section, you will analyze the strengths and areas of need in the above response and describe an instructional intervention that addresses the learning needs of the student(s) reflected in the response. Include a strategy for helping the student(s) build a viable argument (e.g., an explanation about why a solution is correct, a justification for a step in a solution process, a rationale for the validity of a result) that is related to the given learning standard.

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

[New York State Education Department. *New York State Next Generation Mathematics Learning Standards*. 2017, updated June 2019, www.nysed.gov/curriculum-instruction/new-york-state-next-generation-mathematics-learning-standards.

Marecek, Lynn, et al. *Algebra 1*. OpenStax, 2025, openstax.org/books/algebra-1/pages/about-this-course.

Illustrative Mathematics. *Imagine IM Algebra 1, Teacher Edition*. Vols. 1-2, Imagine Learning LLC, 2024.

Savvas Learning Company. *enVision Algebra 2, Teacher's Edition*. Savvas Learning Company LLC, 2024.]

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 competency text, instructions, and prompts do not count toward your page limit. Your submission cannot contain hyperlinks to any materials.

Using the sample student response developed for Prompt #4, prepare a response in which you:

1. identify a significant mathematical strength related to the standard you identified in Prompt #1 that is demonstrated in the sample student response, citing specific evidence from the response to support your assessment;
2. identify a significant area of need related to the standard you identified in Prompt #1 that is demonstrated in the sample student response, citing specific evidence from the response to support your assessment; and
3. describe an instructional intervention that you could use with the student(s) to build on student strengths and support student improvement in the identified area of need. The intervention should include a strategy for helping the student(s) build a viable argument related to the given standard.

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