



Your competence will be assessed as you complete the DOT1 performance assessment for this course of study. This course of study may take up to 4 weeks to complete.

Introduction

Introduction

Review the [Math Program Course Mentoring](#) document for your specific math course mentor information.

Overview

The DOT1 performance assessment focuses on the construction of original lesson plans using appropriate research-based age-specific pedagogies. This course of study covers geometry, equivalence, proportional reasoning, problem solving, probability, and the use of appropriate justifications within pedagogy.

Outcomes and Evaluation

There are 2 competencies covered by this course of study; they are listed in the "[Competencies for Specific Teaching Practices: Mathematics Teaching Topics \(DOT1\)](#)" page.

Teaching Dispositions Statement

Please review the [Statement of Teaching Dispositions](#).

You will complete the following assessments as you work through the course of study.

Performance Assessment

You will complete the following performance assessment in [TaskStream](#):

- DOT1

Previews of task instructions and rubrics for this assessment are available in via the 'Assessment Preparation' box in the online course of study.

Preparing for Success

The information in this section is provided to help you become ready to complete this course of study. As you proceed, you will need to be organized in your studies in order to gain competency in the indicated areas and prepare yourself to pass the final assessments.

Your Learning Resources

The learning resources listed in this section will be required to complete the activities in this course of study. Follow the instructions provided to access these resources as early as possible in order to give yourself time to become familiar with them.

Enroll in Learning Resources



You will need to enroll in or subscribe to additional learning resources as a part of this course of study.

You may already have enrolled in these resources for other courses. Please check the "Learning Resources" tab and verify that you have access to the following learning resources. If you do not currently have access, please enroll or renew your enrollment at this time.

Note: For instructions on how to enroll in or subscribe to learning resources through the "Learning Resources" tab, please see the ["Acquiring Your Learning Resources"](#) page.

Pearson

Enroll in the following Pearson course:

- Teaching Math Grades 5–12

This resource provides access to the following e-texts:

- Posamentier, A.A., Smith, B.S., & Stepelman, J. (2009) *Teaching secondary mathematics: Techniques and enrichment units* (8th ed.). Boston: Allyn & Bacon. ISBN: 0135000033.
- Van de Walle, J.A., Karp, K.S., & Bay-Williams, J.M. (2009) *Elementary and middle school mathematics: Teaching developmentally*, (7th ed.). Boston: Allyn & Bacon. ISBN: 0205573525.

Note: These e-texts are available to you as part of your program tuition and fees, but you may purchase hard copies at your own expense through a retailer of your choice. If you choose to do so, please use the ISBN listed to ensure that you receive the correct edition.

Additional Preparation

There are many different learning tools available to you within your course of study in addition to the learning resources already discussed. Take the time to familiarize yourself with them and determine how best to fit them into your learning process.

Message Boards, FAQs, Note-Taking Tool

Message boards, FAQs, and a note-taking tool are available in every course of study.

Use the ["Additional Learning Tools"](#) page to review these tools.

The WGU Central Library

The [WGU Central Library](#) is available online to WGU students 24 hours a day. The library offers access to a number of resources, including over 60,000 full-text e-books; articles from journals, magazines, and newspapers; course e-reserves; and tutorials on how to use these resources and the library. The library also includes a reference service for help with research questions or navigating the library.



For more information about using the WGU Library, view the “WGU Library: Finding Articles, Books & E-Reserves” video in the Student Resources section of [The WGU Channel](#).

Center for Writing Excellence: The WGU Writing Center

If you need help with any part of the writing or revision process, contact the Center for Writing Excellence (CWE). Whatever your needs—writing anxiety, grammar, general college writing concerns, or even ESL language-related writing issues—the CWE is available to help you. The CWE offers personalized individual sessions and weekly group webinars. For an appointment, please e-mail writingcenter@wgu.edu <mailto:writingcenter@wgu.edu>.

Course Mentor Assistance

Course mentors are available to help you. Their job is to aid understanding in areas where you need to improve and to guide you to learning resources. Request their help as needed when preparing for assessments.

Course mentors cannot provide reviews of entire assessments. If you fail assessment attempts, review the provided feedback first, then ask the course mentor specific questions about what you can do to meet the competency standard. Request course mentor assistance as necessary in preparing for second attempts at objective assessments or performance task revisions. Mentors cannot guarantee you pass as they do not evaluate assessments; however, they can provide the assistance and advice necessary to help you succeed.

Pre-clinical Experience Cohorts

When you tackled tasks in the Foundations of Teaching domain, you did some that involved Pre-clinical Experiences (PCE). In Specific Teaching Practices, you will find that PCE is a more hands-on experience. The PCE tasks in this domain require a minimum of 30–40 hours of in-school observations and reflections; in addition, you will be asked to teach actual lessons that require planning and presentation. You will need to analyze practice as it relates to educational theory, reflect on your own practice, record these thoughts, and draw informed conclusions about your application of these theories.

As the need arises, students will be able to attend weekly pre-clinical experience cohorts that allow students from the DOT, DMT, and DGT assessments to collectively discuss issues that arise during the completion of PCE tasks. The primary purpose of these cohorts is to provide a venue for open and active discussion with regard to clarification of task requirements, implementation of relevant mathematics pedagogy in the classroom, and any other relevant issues. One of the best aspects of these cohorts is that everyone benefits. While you are requesting clarification with regard to a specific PCE task, you will also have an opportunity to learn about future PCE tasks within the DOT, DMT, and DGT assessments. Another benefit to attending these cohorts is that it will serve as preparation for the mandatory demonstration teaching seminar that appears later in your program.

Classroom Lesson Planning Overview

You will now begin your exploration of how to design lesson plans for mathematics classrooms. Recall how to design appropriate lesson plans, how to sequence activities properly, how to



anticipate potential student difficulties, and how to recognize when remediation may be necessary. All of the knowledge and skills that you have already learned still apply. Now, however, you will begin to apply these more general pedagogical skills in a math classroom.

You will be required to observe a math class, plan a lesson, and then teach it to a small group of students. The particular topic that you will address will depend on the class in which you are placed. Be sure to consult with the cooperating teacher as you plan the lesson you will teach.

Competencies covered by this subject

602.5.1 - Teaching Methods-Mathematics (Secondary)

The graduate provides effective, research-based mathematics curriculum instruction.

Lesson Planning Overview

You will start by reviewing how to design a good lesson plan, with the focus now on what characterizes such a mathematics lesson plan.

Long-Range and Short-Range Planning

Read the following chapter in *Teaching Secondary Mathematics: Techniques and Enrichment Units*:

- chapter 2 ("Long-Range and Short-Range Planning")

Answer the following questions:

- Did you effectively distinguish between the prerequisite skill and the one that follows?
- Are you sure that students understand the prerequisite skill?
- How can you ascertain whether or not they have grasped that concept or mastered the skill?
- Why do you think that this is important?
- Students will be much more likely to be engaged if you can make this a fun lesson. If you implemented the lesson plan you created, would your students have fun?
- How would you construct the desired classroom dynamic so that students enjoyed learning?

602.5.1-02 Performance Task

Complete the following task in [TaskStream](#):

- DOT1: 602.5.1-02

For directions on how to receive access to performance assessments, see the "[Accessing Performance Assessments](#)" page.

Contact the supervisor of your school placement to arrange to observe a secondary mathematics teacher teach a skill students need to solve problems from the secondary mathematics curriculum.

Contact the supervisor of your school placement to arrange to teach a small group of 6–10



secondary mathematics students.

Meet with the classroom teacher beforehand to determine which skill to teach and to discuss which teaching strategy or strategies might be most effective.

The classroom teacher must observe your instruction and complete the observer checklist found in TaskStream.

Geometry Brainstorming

The best geometric derivations are those that place students in a position to use prior understandings to derive new ones. Typically, students learn about simple geometries such as rectangles and triangles before learning about more complex quadrilaterals (i.e. parallelograms, trapezoids, etc.). Can you identify any of the indicated simpler geometries within the parallelogram shown below?

Simpler Geometries

Rectangles

Triangles



Answer the following questions:

- What are ways in which you can help students to discover, develop, and derive the formula for a selected geometric figure?
- In what ways can you help your students construct their own understandings of the desired content and skills?
- What prior knowledge may 8th graders have with regard to the derivation of area formulas for such simple geometries?
- Can you create a lesson plan that builds on this prior knowledge?

The following activities contain additional resources that may prove useful as you engage in this activity.

Geometric Thinking and Geometric Concepts

Read the following chapter in *Elementary and Middle School Mathematics: Teaching Developmentally*:

- chapter 20 ("Geometric Thinking and Geometric Concepts")

It is recommended that you look through the References section in *Teaching Secondary Mathematics: Techniques and Enrichment Units*. Should you desire a more comprehensive exploration of selected topics, this section will provide you with many sources of additional information. Keep this in mind while you work on each of the tasks associated with this



assessment.

Lesson Plan Examples

The ["Area Formulas"](#) web page provides several examples of lesson plans that have been constructed to help students discover the area formulas for a variety of selected geometric figures. This should help you think about how to plan to teach a geometry lesson.

National and State Mathematics Standards

The [TaskStream](#) website provides tools that allow you to identify national and state mathematics standards. You should be able to make connections between these standards and the lesson plans that you construct. To access these tools, log into TaskStream, click on "Standards Manager" (under "Resources"), and then click on "Browse Standards." You can choose "View State Standards" or "View US National Standards" and explore the desired standards. You must be able to make connections between the lessons you construct and the corresponding standards. Be sure to include relevant state and national standards whenever prompted to do so.

Exploring What It Means To Know and Do Mathematics

Read the following chapter in *Elementary and Middle School Mathematics: Teaching Developmentally*:

- chapter 2 ("Exploring What It Means To Know and Do Mathematics")

These readings will help you prepare to make connections between what you have learned about general pedagogy and what you are about to learn.

Geometry Study Notebook Activity

In this study notebook activity, you will need to construct an original lesson plan using appropriate research-based, age-specific pedagogies that infuse selected mathematics topics from geometry.

Note: You will not submit this activity in TaskStream.

In your study notebook, create an original lesson plan (for one class period) to teach eighth grade students to discover a formula to find the area of a parallelogram. Use the [lesson plan template](#) for this and for all other tasks in this assessment.

Consider the following questions:

- How can you include the ideas you just learned in order to make an interesting, pedagogical lesson covering the formula for the area of a parallelogram?
- Can you design activities that allow students to discover the formula without giving it to them directly?
- What manipulations or technologies might you employ?
- Why would you use them-that is, what is your rationale for using them?



Teaching Equivalence

After engaging in the activities in this subject, you will construct an original lesson plan using appropriate research-based age-specific pedagogies that infuse selected mathematics topics that focus on equivalent relationships. In the lesson, you will

- describe how to teach the concept of equivalence when working with fractions with unlike denominators;
- infuse selected mathematics models (area/region model, length/set model) to help students understand mathematics that they might simply memorize and apply; and
- construct a learning dynamic that has students discover, develop, derive, and conceptually understand the equivalent fraction algorithm.

Competencies covered by this subject

602.5.1 - Teaching Methods-Mathematics (Secondary)

The graduate provides effective, research-based mathematics curriculum instruction.

Equivalence

One of the goals of Teaching Equivalence is to develop an original lesson plan in which students will derive the equivalent fraction algorithm. Students will need to be taught to manipulate and work with two models that show fraction equivalency: one area/region model and one length/set model.

Developing Fraction Concepts

Read the following chapter in *Elementary and Middle School Mathematics: Teaching Developmentally*:

- chapter 15 ("Developing Fraction Concepts")
- chapter 16 ("Developing Strategies for Fraction Computation")

Reflect on what you have read. Interact with other students studying these topics via the message board. See what others have written, post your response to questions posed, or ask questions of your own. As you engage in the material, think about what you consider to be the most interesting facts presented. Record your reflections in your study notebook.

Algorithm

Look up the term algorithm and try to make the appropriate connections to the term equivalent fraction algorithm. Interact with other students studying these topics via the message board. See what others have written, post your response to questions posed, or ask questions of your own. As you engage in the material, think about what you consider to be the most interesting facts presented. Record your reflections in your study notebook.

Equivalence Lesson Plan

Using the [lesson plan template](#), develop an original lesson plan in which students are taught to manipulate and work with two models that show fraction equivalency: one area/region model, and one length/set model.



Have students discover, develop, and derive an equivalent fraction algorithm.

Write up this lesson plan in your study notebook. Be sure to include supporting details, and appropriate activities.

Teaching Proportional Reasoning

In the previous task, you explored the relationship between ratio, proportion, and fraction equivalency. Equivalent fractions are a special type of proportions. In this subject, you will need to identify the relationship between the concept of ratio/proportion and percentage.

After engaging the material and completing the activities that follow, you will be required to construct an original lesson plan using appropriate research-based age-specific pedagogies that infuse selected mathematics topics that focus on proportional reasoning. After completing the activities below you will be able to

- describe how to use proportional reasoning with percentage problems;
- infuse selected mathematics models (i.e., line segment model) to help students understand mathematics that they might simply memorize and apply;
- construct a learning dynamic that has students explore three types of percentage problems: (1) part unknown; (2) percent/fraction unknown; and (3) whole unknown;
- construct a learning dynamic that has students discover, develop, derive, and conceptually understand the cross-product algorithm; and
- think about these bullet points as you read and reflect on the chapters assigned.

Competencies covered by this subject

602.5.1 - Teaching Methods-Mathematics (Secondary)

The graduate provides effective, research-based mathematics curriculum instruction.

Ratio, Proportion, and Percent

In this topic, you will design an original lesson plan to teach proportional reasoning when solving percent problems in grades 5–8.

Teaching More Effective Lessons

Read the following chapters in *Elementary and Middle School Mathematics: Teaching Developmentally*:

- chapter 17 ("Developing Concepts of Decimals and Percents")
- chapter 18 ("Proportional Reasoning")

Brainstorm ways in which you can help students to discover, develop, and derive concepts related to proportional reasoning. In what ways can you help your students construct their own understandings of the desired content and skills?

Teaching Ratio, Proportion, and Percent

The practical applications of ratio, proportion, and percent in real-world situations are so numerous that students need to acquire the ability to perceive and determine relationships between these concepts.



Using the [lesson plan template](#), design an original lesson plan to teach proportional reasoning when solving percent problems in 5th to 8th grade.

In your lesson plan, include activities that allow for the following experiences:

- Students discover, develop, derive, and conceptually understand the cross-product algorithm via conceptually based approaches such as the line segment model.
- Students explore three types of percentage problems: (1) part unknown; (2) percent/fraction unknown; and (3) whole unknown.

Write up this lesson plan in your study notebook. Be sure to include supporting details and appropriate activities that would allow your students to derive the cross-product algorithm on their own.

Teaching Problem Solving

In this section, you will be required to describe a variety of appropriate research-based age-specific problem solving techniques that can be used to encourage flexibility and persistence in solving mathematics problems. After completing this section's activities, you will be able to

- describe general age-specific problem solving processes,
- describe specific age-specific mathematics problem solving strategies, and
- discuss how these processes and strategies encourage students to persist through difficult problems.

Competencies covered by this subject

602.5.1 - Teaching Methods-Mathematics (Secondary)

The graduate provides effective, research-based mathematics curriculum instruction.

Problem Solving

Most mathematics textbooks teach students computational skills that are then applied to solving problems. Teaching mathematics through real-world contexts and problems that then give rise to computational techniques, while exactly opposite the norm, is supported in the literature as better promoting students' mathematical understanding.

The Role of Problem Solving

Read the following chapter in *Elementary and Middle School Mathematics: Teaching Developmentally*:

- chapter 3 ("Teaching Through Problem Solving")

Every classroom contains a diverse community of learners. How students construct their own understandings of how to solve selected mathematics problems can vary from student to student and problem to problem. Listed here are some of the different ways in which students construct such understandings.



- guessing, checking, and revising
- drawing pictures
- acting out or using objects (i.e., manipulatives)
- making and using organized lists, charts, tables, or graphs
- looking for discernible patterns
- using logical reasoning (i.e., deductive versus inductive reasoning)
- working backwards
- solving simpler or similar problems

You need to be able to properly discern between general problem solving processes and specific problem solving strategies. Also, you need to be able to describe how these processes and strategies can be used to encourage students to persist through difficult problems. Interact with other students studying these topics via the message board. See what others have written, post your response to questions posed, or ask questions of your own. As you engage in the material, think about what you consider to be the most interesting facts presented. Record your reflections in your study notebook.

Problem Solving Video and Reflection

After logging on to the Teaching Mathematics Grades 5–12 website, click on the "Teaching Math Resource" link found on the left-hand side of the page. Then click on the "Problem Solving" link and review all of the material provided within this topic. The links found there present you with snippets of video from real-world math classes and ask you to reflect on various aspects you see in the video.

Answer the following questions:

- Can you effectively distinguish between general problem solving processes and specific strategies that can be used to solve mathematics problems?
- Flexibility and persistence are extremely important in any classroom for both teachers and students. Why do you think these are important?

602.5.1-15 Performance Task

Complete the following task in [TaskStream](#):

- DOT1: 602.5.1-15, 603.1.4-04

For directions on how to receive access to performance assessments, see the ["Accessing Performance Assessments"](#) page.

You will need to observe a math class, create a lesson plan using the [lesson plan template](#), and then teach the lesson. The lesson should cover problem solving strategies that students need to know in order to solve problems, and that help encourage students to persist through difficult problems.

After teaching the lesson, you will write an essay about your experience. Specific instructions for your essay are included in the task directions found in TaskStream. The essay will be submitted



as an attachment to the task in TaskStream.

Probability Lesson Plan

Teaching probability can be difficult. Students sometimes grapple with the concept and often have widely varying concepts of what probability is and how to go about determining probabilities. For instance, which is more probable: getting struck by lightning, or winning the lottery? Many students will pick the latter, perhaps because of the publicity that surrounds lottery winners. However, they will be surprised to find out that you are much more likely to be struck by lightning than to win the lottery.

In this section, you will be required to construct an original lesson plan using appropriate research-based age-specific pedagogies dealing with teaching probability. After completing this section's activities you will be able to

- compute experimental and theoretical probabilities using proper counting techniques,
- describe the steps associated with the determination of experimental and theoretical probabilities using proper counting practices,
- distinguish the difference between experimental and theoretical probability, and
- test theoretical computations against experimental data.

Competencies covered by this subject

602.5.1 - Teaching Methods-Mathematics (Secondary)

The graduate provides effective, research-based mathematics curriculum instruction.

Teaching Probability

To effectively perform probability computations, you must use appropriate counting practices in order to ascertain the total number of desired outcomes (observed - experimental; possible - theoretical) and total number of outcomes (observed/experimental; possible/theoretical). Once you have decided which counting practices must be employed for the probability computation under consideration, you can then compute the desired probabilities.

Experimental vs. Theoretical Probabilities

Experimental probabilities are those probabilities that are determined through practice.

Essentially, you go out and perform a series of trials with the intent of observing the desired outcomes (or events) and all possible outcomes (or all possible events). Once you have this data, you can then compute the desired experimental probabilities.

Theoretical probabilities are those probabilities that are determined using mathematics.

Essentially, you use proper counting techniques to mathematically determine the number of possible desired outcomes (or events) and all possible outcomes (or all possible events). Once you have these mathematically determined results, you can then compute the desired theoretical probabilities. This is purely an intellectual activity, there are no actual trials run.

Experimental Probability Example 1: Using a fair coin, determine the experimental probability of acquiring a heads on a single toss. Perform 30 tosses and then compute the desired experimental probability. Your sample space will contain 30 outcomes (or events). Fill in the table shown below. For each toss, place an X under the observed outcome (Head or Tail). How



will you compute the desired experimental probability using this data?

Hint: Count the total number of X's for Heads. Count the total number of X's placed in the table. Now use these two numbers to compute the desired experimental probability.

Experimental Probabilities-Tossing a Fair Coin

Toss	Heads	Tails	Toss	Heads	Tails
1			16		
2			17		
3			18		
4			19		
5			20		
6			21		
7			22		
8			23		
9			24		
10			25		
11			26		
12			27		
13			28		
14			29		
15			30		

Experimental Probability Example 2: Using a fair coin, determine the experimental probability of flipping heads twice in two tosses. Perform 30 trials of two tosses each and then compute the desired experimental probability. Your sample space will contain 30 trials (or events). Fill in the table shown below. For each toss, write the result ("Heads" or "Tails") in each column for both tosses for each trial. How will you compute the desired experimental probability using this data?

Hint: Count the total number of successful trials resulting in two "Heads" for both tosses. Count the total number of trials in the experiment. Now use these two numbers to compute the desired experimental probability.

Experimental Probability: Tossing a Fair Coin Twice



Trial	First Toss	Second Toss	Trial	First Toss	Second Toss
1			16		
2			17		
3			18		
4			19		
5			20		
6			21		
7			22		
8			23		
9			24		
10			25		
11			26		
12			27		
13			28		
14			29		
15			30		

Now compute the theoretical probabilities of flipping a heads on a single toss, and of flipping heads twice in two tosses.

Hint: How many heads can you obtain on the first toss? How many total possible outcomes are there on the first toss? Now use these two numbers to compute the desired theoretical probability. Were your experimental and theoretical probabilities similar? Repeat the process to find the theoretical probability for two tosses.

Answer the following questions:



- Were your experimental and theoretical probabilities similar?
- What do you think happens to the experimental probability as the total number of trials becomes arbitrarily large?

Although these are relatively simple examples, these concepts are extremely important for you to understand.

Probability Brainstorming

Read the following chapter in *Elementary and Middle School Mathematics: Teaching Developmentally*:

- chapter 22 ("Exploring Concepts of Probability")

Brainstorm ways in which you can help students to discover, develop, and derive concepts that are related to probability.

Answer the following question:

- In what ways can you help students construct their own understandings of the desired content and skills?

Probability Video and Reflection

After logging on to the Teaching Mathematics Grades 5–12 website, click on the "Teaching Math Resource" link found on the left-hand side of the page. Then click on the "Case 4" link and review all of the material provided within this topic. The links found there present you with videos from real-world lessons on probability and ask you to reflect on various aspects you see in the videos. Interact with other students studying these topics via the message board. See what others have written, post your response to questions posed, or ask questions of your own. As you engage in the material, think about what you consider to be the most interesting facts presented. Record your reflections in your study notebook.

602.5.1-33, 35 Performance Task

Complete the following task in [TaskStream](#):

- DOT1: 602.5.1-33, 35

For directions on how to receive access to performance assessments, see the ["Accessing Performance Assessments"](#) page.

Contact the supervisor of your school placement to arrange to teach a class of secondary mathematics students. Using the [lesson plan template](#), develop an original lesson plan that includes

- teaching a multi-step math problem from the secondary mathematics curriculum using an effective mathematics teaching model (a 30–40 minute lesson) and
- providing students opportunities to solve a problem that is structurally similar to another



given problem (during a 20–30 minute practice session).

Note: This may be over a two-day period. You will need to meet with the classroom teacher beforehand to determine which math problems to teach and which mathematics teaching model to use.

Justification

Many times students will generate the correct answer to a mathematics problem without understanding why it is correct. The logic that was employed to arrive at an answer is as important as the answer itself. It is for this reason that you must have students justify their answers.

Mathematics is a field of study that is built on axioms (postulates), laws, theorems, corollaries, etc. It is important that students understand how to infuse such foundational aspects to mathematics at all levels when justifying the answers that they arrive at. For instance, students should not learn mathematical laws (i.e., commutative law for addition) just for the sake of memorizing the laws. They must understand how such laws justify the answers that they arrive at. After completing this section, you will be able to

- describe and explain a variety of appropriate strategies that can be used to encourage students to share their ideas, processes, and procedures used to solve various types of mathematics problems and
- explain why it is important for students to justify their solutions.

Competencies covered by this subject

602.5.1 - Teaching Methods-Mathematics (Secondary)

The graduate provides effective, research-based mathematics curriculum instruction.

Justification

After completing the activities that follow, you will construct a description of a variety of appropriate research-based age-specific instructional practices that can be employed when students are correct but uncertain. Such practices should involve asking students to describe procedures, rules, and/or definitions that were involved in arriving at a particular result. How many different strategies can you identify and describe which encourage students to share their ideas, processes, and procedures used to solve various types of problems?

Teaching the Use of Justification

Review the following chapter in *Elementary and Middle School Mathematics: Teaching Developmentally*:

- chapter 3 ("Teaching Through Problem Solving")

Brainstorm ways in which you can help students to discover, develop, and derive concepts related to the use of appropriate justifications.

Answer the following question:

- In what ways can you help your students construct their own understandings of the



desired content and skills?

The [Daily Teaching Tools website](#) provides a discussion of each of the following cooperative learning techniques:

- jigsaw
- think-pair-share
- three-step interview
- round robin brainstorming
- three-minute review
- numbered heads
- team pair solo
- circle the sage
- partners

These cooperative learning techniques may be used solely during the course of a lesson or in combination to promote a very lively and effective learning dynamic in a variety of content areas and age groups. Interact with other students studying these topics via the message board. See what others have written, post your response to questions posed, or ask questions of your own. As you engage the material, think about what you consider to be the most interesting facts presented. Record your reflections in your study notebook.

602.5.1-36 Performance Task

Complete the following task in [TaskStream](#):

- DOT1: 602.5.1-36

For directions on how to receive access to performance assessments, see the ["Accessing Performance Assessments"](#) page.

Misconceptions, Mistakes, and Errors

In this section, you will investigate some errors that students commonly make. When students make mistakes, it is often easier to see what they did wrong than it is to identify why they made the mistake. The ability to rapidly identify the source of the error, be it a misconception, a misunderstanding, or a simple calculation mistake, is critical.

Competencies covered by this subject

602.5.1 - Teaching Methods-Mathematics (Secondary)

The graduate provides effective, research-based mathematics curriculum instruction.

Common Mathematical Mistakes

In this topic, you will now review some common mathematical mistakes that students sometimes make. A list of some sample mistakes and websites that cover the concepts in question has been provided. As you review the actual math content, ask yourself what might make students misunderstand or misapply a concept.

Error Analysis



The following websites address common types of mathematical errors:

- [Inequalities and Negative Numbers](#)
- [Solving One-Step Linear Equations](#)

Think about what might cause each of the errors you see listed below. Reflect on the different types of errors that students can make. Is it easier to correct a calculation error or to reverse a misconception?

As you analyze the errors seen in the example below, try to place yourself in the mind of the student making the mistake. Answer the following questions:

- Can you ascertain what they were thinking?
- Can you identify and explain what they should have done instead?
- Can you do so in such a way as to make it clear to the student why they were wrong, and what they should do in order to be accurate the next time they encounter such an item?

1. $-13x > 65$, so $x > -5$
2. $2^{-2} = -4$
3. $(3/2)x = 24/15$, so $x = 10/16$
4. $x^{5/2} = 81/64$, so $x = 3/8$
5. $\ln(2 + n) = (\ln 2)(\ln x)$
6. Let $a = b$
 $ab = a^2$
 $ab - b^2 = a^2 - b^2$
 $b(a - b) = (a + b)(a - b)$
 $b = a + b$
 $b = 2b$
 $1 = 2$

602.5.1-40 Performance Task

Complete the following task in [TaskStream](#):

- DOT1: 602.5.1-40

For directions on how to receive access to performance assessments, see the "[Accessing Performance Assessments](#)" page.

English Language Math Content

In this section you will describe a variety of appropriate research-based age-specific instructional practices that can be employed when students are non-native English speakers. After this section, you will be able to describe and explain a variety of appropriate strategies that



can be used to teach mathematics.

Competencies covered by this subject

602.5.1 - Teaching Methods-Mathematics (Secondary)

The graduate provides effective, research-based mathematics curriculum instruction.

English Language Skills

In this topic you will learn how to increase your students' English language skills.

Teaching English Language Skills in a Math Classroom

Read the following chapter in *Elementary and Middle School Mathematics: Teaching Developmentally*:

- chapter 6 ("Teaching Mathematics Equitably to All Children")

Pay particular attention to the sections on teaching English language learners.

602.5.1-42 Performance Task

Complete the following task in [TaskStream](#):

- DOT1: 602.5.1-42

For directions on how to receive access to performance assessments, see the "[Accessing Performance Assessments](#)" page.

Arrange to teach an original 30–40 minute lesson to a class of secondary mathematics students that teaches English language content-based reading and writing skills to all students in the context of teaching a given mathematics concept or problem.

The classroom teacher must observe your instruction and complete the observer checklist found in TaskStream.

Final Steps

Congratulations on completing the activities in this course of study! This section will guide you through the assessment process.

Assessment Information

The activities in this course of study have prepared you to complete the DOT1 performance assessment. If you have not already completed the assessment, you will do so now.

Accessing Performance Assessments

You should have completed the following tasks as you worked through this course of study. If you have not completed the tasks in [TaskStream](#), do so now.

- DOT1: 602.5.1-02
- DOT1: 602.5.1-15, 603.1.4-04
- DOT1: 602.5.1-33, 35
- DOT1: 602.5.1-36



- DOT1: 602.5.1-40
- DOT1: 602.5.1-42

For directions on how to receive access to performance assessments, see the ["Accessing Performance Assessments"](#) page.

Feedback

WGU values your input! If you have comments, concerns, or suggestions for improvement of this course, please submit your feedback using the following form:

- [Course Feedback](#)

ADA Requirements

Please review the [University ADA Policy](#).