Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	149	MTH 149 08/25/2023-Functional Math for Elementary Teachers II
College	Division	Department
Math, Science and Engineering Tech	Math, Science and Engineering Tech	Math & Engineering Studies
Faculty Preparer		Nichole Klemmer
Date of Last Filed Assessment Report		

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   June 2021

2. Briefly describe the results of previous assessment report(s).

   89% of students showed success on outcome #1.

   96% of students showed success on outcome #2.

   96% of students showed success on outcome #3.

   98% of students showed success on outcome #4.

   100% of students showed success on outcome #5.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   The intended changes/plans from the previous report included more hands-on probability simulations in class, incorporating more K-12 activities, and adding final exam questions to better assess outcome number 5. We started working on all of these changes immediately after the assessment report was submitted. We created a hands-on "probability fun day" lesson, added many K-12 worksheets as warm-ups and exit problems, and added 3 more questions on the final exam pertaining to outcome number 5.

II. Assessment Results per Student Learning Outcome

Outcome 1: Solve problems using concepts related to probability, descriptive statistics and inferential statistics.

- Assessment Plan
    - Assessment Tool: Outcome-related common test questions
    - Assessment Date: Spring/Summer 2024
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4, out of 4 possible points (as defined on the rubric)
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023, 2022	2022

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
71	71

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students (on campus and virtual) were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess this outcome. Each question was scored out of 1 point, using this rubric:

0: The student does not attempt the problem.

.25: The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.

.5: The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.

.75: The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.

1: The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
63/71 (89%) of students were successful. The standard of success was met for this outcome and tool.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did well drawing probability trees, listing out the sample space and computing basic probability. They also did well drawing box-and-whisker plots and line plots as well as answering questions using the plot.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The standard of success was met for this outcome but there's room for improvement, particularly with graphing and answering questions using different types of graphs. I want to continue looking for K-6 graphing activities so my students can practice using the types of graphs they will do with their elementary-aged students. I also want to incorporate absolute mean deviation on the next final exam since that's a new objective in the course.

Outcome 2: Understand the major concepts of Euclidean geometry with a focus on coordinate and transformational concepts.

- Assessment Plan
    - Assessment Tool: Outcome-related common test questions
    - Assessment Date: Spring/Summer 2024
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4, out of 4 possible points (as defined on the rubric)
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2022, 2023	2022

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
71	71

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students (on campus and virtual) were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess this outcome. Each question was scored out of 1 point, using this rubric:

0: The student does not attempt the problem.

.25: The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.

.5: The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.

.75: The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.

1: The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
64 out of 71 (90%) students were successful on this outcome. The standard of success was met for this outcome and tool.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The areas of strength in student achievement were naming polyhedra, drawing lines of symmetry, and finding area and perimeter of 2D figures.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The standard of success was met for this outcome. That said, I'd like to continue focusing on ways to help students improve in finding area and volume of 3D figures. Visualizing these figures and identifying important parts (height, base, etc.) seems to be the most difficult task, so we will continue finding ways to help students practice these skills more in class.

Outcome 3: Apply the process of measurement to two-and three-dimensional objects using non-standard, English, and metric units.

- Assessment Plan
    - Assessment Tool: Outcome-related common test questions
    - Assessment Date: Spring/Summer 2024
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4, out of 4 possible points (as defined on the rubric)
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023, 2022	2022

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
71	71

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students (on campus and virtual) were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess this outcome. Each question was scored out of 1 point, using this rubric:

0: The student does not attempt the problem. .25: The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort. .5: The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear. .75: The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation. 1: The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
65 out of 71 (92%) students were successful on this outcome. The standard of success was met for this outcome and tool.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did really well converting temperature from Celsius/Fahrenheit and converting metric units.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The standard of success was met. That said, I plan on continuing to help students with English conversions (particularly ones like mi/hr to ft/min) and gaining a better understanding of how big metric units really are (for example, should we use meters or kilometers to measure how long the bus is?).

Outcome 4: Practice high leverage core teaching practices and examine how they can be helpful in teaching Pre-Kindergarten through sixth grade (PK-6).

- Assessment Plan

- Assessment Tool: Teaching demonstration project and analysis assignments on Blackboard
- Assessment Date: Spring/Summer 2024
- Course section(s)/other population: All sections
- Number students to be assessed: All students
- How the assessment will be scored: Departmentally-created rubric
- Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4, out of 4 possible points (as defined on the rubric)
- Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2023, 2022	2022

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
71	71

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students (on campus and virtual) were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

A teaching demonstration project and three analysis assignments on Blackboard were used to assess this outcome. Each project/assignment was scored on a scale from 0-1 using this rubric: 0: The student did not complete this assignment

.25: The student did very little to demonstrate that they understand the high leverage core teaching practices.

.5: The student partially demonstrated that they understand the high leverage core teaching practices.

.75: The student substantially demonstrated that they understand the high leverage core teaching practices.

1: The student fully demonstrated that they understand the high leverage core teaching practices.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
58 out of 71 students (82%) were successful on this outcome. The standard of success was met for this outcome and tool.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did really well on their projects. Every single student turned one in! Most scores were in the 80%-100% range which was great.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

This outcome had the lowest success rate but only because of students not turning in analysis assignments. There were very few low grades due to lack of understanding- either students turned them in and did well or didn't turn them in at all. I'm considering making these worth more points to encourage more students to turn them in.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

In the previous report, I identified three intended changes:

1.Incorporate more hands-on probability activities

2. Incorporate more K-12 material

3. Incorporate more questions assessing the measurement outcome on the final exam

We were able to do all three of these items. All standards of success were met last time and this time, so it's hard to say how much these changes improved student learning. Anecdotally, I noticed positive benefits in the first two items. Students seemed more comfortable with probability and I felt they were more prepared having been exposed to more K-12 worksheets and activities. It was also helpful to have a few more measurement questions on the final exam. I was able to more easily identify the specific types of measurement questions that students do well on and struggle with.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

I think this course is doing a great job meeting the needs of students. The assessment process didn't bring to light anything that surprised me, but it did remind me that we need to continue checking in with our K-12 partners to make sure that our course aligns well with what elementary teachers need in today's world.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

I plan on having a meeting with the other Math for Elementary Education instructors to share this information. I'm also planning on participating in a working group with some EMU Math for Elementary instructors in the fall and I'll plan on sharing this with them as well.

4.

Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	Incorporate absolute mean deviation on the next final exam.	This is a new objective in the course.	2024
Course Assignments	Explore increasing point value for analysis assignments.	To encourage more students to turn in these assignments.	2024

Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Additional emphasis, material or practice related to the following areas: OC#1: Graphing and answering questions using graphs OC#2: Finding area and volume of 3D figures OC#3: English conversions, helping students understand better how big metric units are	Additional emphasis, material or practice will support student learning.	2024

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

MTH 149 Assessment Data_SS 2023

Faculty/Preparer:	Nichole Klemmer	**Date:**	08/25/2023
Department Chair:	Nichole Klemmer	**Date:**	08/25/2023
Dean:	Tracy Schwab	**Date:**	08/25/2023
Assessment Committee Chair:	Jessica Hale	**Date:**	10/26/2023

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	149	MTH 149 06/14/2021-Functional Math for Elementary Teachers II
College	Division	Department
	Math, Science and Engineering Tech	Math & Engineering Studies
Faculty Preparer		Nichole Klemmer
Date of Last Filed Assessment Report		10/24/2017

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   Yes, this course was previously assessed on 6/6/2017.

2. Briefly describe the results of previous assessment report(s).

   The standard of success, defined as at least 75% of students scoring a 75% or higher, was met for all five outcomes.

   88% of students met the objective for outcome 1.

   97.6% of students met the objective for outcome 2.

   78% of students met the objective for outcome 3.

   92.7% of students met the objective for outcome 4.

   82.9% of students met the objective for outcome 5.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   The action plan included sharing the results with the department, which I did at our first department meeting in Fall 2017. The MTH 149 instructors met in the

Summer of 2017 and we went over the results of the assessment and talked about changes we wanted to make for the future. In addition, the action plan included integrating more hands-on probability experiments into the course and having students identify parts of shapes prior to jumping into area and volume. Both of those plans were implemented in the Winter of 2019 and have continued ever since.

II. Assessment Results per Student Learning Outcome

Outcome 1: Solve problems using concepts related to counting and chance.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2020
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4, out of 4 possible points (as defined on the rubric)
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
47	47

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess all outcomes. Each question was scored out of 1 point, using this rubric:

0: The student does not attempt the problem.
.25: The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
.5: The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.
.75: The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.
1: The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
42 out of 47 (89%) of students scored a 75% or higher on this outcome. The standard of success was met for this outcome and tool.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Overall, students did very well on probability and counting techniques and these are areas of strength for most students. This is impressive since many students usually tell me that this is the hardest part of the course. They did well drawing trees and computing probabilities for single-stage and multi-stage experiments, computing probability from a table of data and a picture, and figuring out the number of combinations possible for a hypothetical situation.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We will continue to incorporate many hands-on simulations of probability experiments to help students fully grasp the concepts. There are a lot of new and fun probability simulators online that I want to try with my classes as well.

Outcome 2: Effectively represent and interpret data through graphs and measures of central tendency and dispersion.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2020
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4, out of 4 possible points (as defined on the rubric)
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
47	47

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess this outcome. All questions were scored out of 1 point using this rubric:

0: The student does not attempt the problem.
.25: The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
.5: The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.
.75: The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.
1: The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
45 out of 47 (96%) of students scored a 75% or higher on this outcome. The standard of success was met for this outcome and tool.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did really well creating their own graphs (stem-and-leaf, box-and-whiskers, scatterplot) and interpreting the graphs to draw conclusions. They also did well computing and interpreting standard deviation and percentiles.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We will continue to have students read, interpret, and create all different kinds of graphs. We would like to incorporate more K-12 material (worksheets and online math programs), particularly focusing on line graphs and pictographs, since we've seen more of a focus on those graphs in K-5 classes in the last few years and we want our students to be prepared for that. I have yet to see a stem-and-leaf plot used in K-12 education, so it might make sense to focus less on those graphs.

Outcome 3: Identify, illustrate, and apply various properties of 2- and 3-dimensional figures.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2020
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4, out of 4 possible points (as defined on the rubric)
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
47	47

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess this outcome. Each question was graded out of 1 point, using this rubric:
0: The student does not attempt the problem.
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1: The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
45 out of 47 (96%) of students scored a 75% or higher on this outcome. The standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did well with questions pertaining to area and perimeter of triangles and quadrilaterals. They also did well with surface area and volume of 3-D figures, particularly simpler problems that didn't require them to find additional measurements prior to calculating the area or volume.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Even though students did very well on this outcome, when they do struggle, it's almost always when needing to identify additional information (using the Pythagorean theorem to find a missing side, for example) prior to computing the surface area or volume. This is a pattern I've seen over the years and have noted in past assessments. We will continue to provide ample practice on this in class and for homework.

Outcome 4: Use the properties of congruence and similarity to solve problems and execute simple constructions.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2020

- Course section(s)/other population: All sections
- Number students to be assessed: All students
- How the assessment will be scored: Departmentally-created rubric
- Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4, out of 4 possible points (as defined on the rubric)
- Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
47	47

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess this outcome. Each question was graded out of 1 point, using this rubric:
0: The student does not attempt the problem.
.25: The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
.5: The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.

.75: The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.
1: The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
46 out of 47 (98%) of students scored a 75% or higher on this outcome. The standard of success was met for this outcome and tool.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did very well on this outcome, at a 98% success rate. They did well identifying the property that proved two triangles similar or congruent and using congruence and similarity statements to find missing parts of a triangle.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The only problem within this outcome that was difficult for some students was the question where one similar triangle was drawn inside of the other. Some students had trouble visualizing the smaller triangle. Instead, they compared the larger triangle with the trapezoid, which doesn't allow them to use similarity properties since they are different shapes. This is a common challenge that students have had throughout the years and we will continue to provide practice for these types of problems in class and on the homework.

Outcome 5: Use the English and Metric systems of measurement to calculate and/or convert measurements: linear, area, perimeter, surface area and volume.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2020
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students

- How the assessment will be scored: Departmentally-created rubric
- Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4, out of 4 possible points (as defined on the rubric)
- Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
47	47

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students were assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess this outcome. Each question was graded out of 1 point, using this rubric:

0: The student does not attempt the problem.
.25: The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
.5: The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.
.75: The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.
1: The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
47 out of 47 students scored 75% or higher on this outcome. The standard of success was met for this outcome and tool.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did the best on this outcome compared to all the others, with a 100% success rate. Students did well converting English and metric units of measurement and rates.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students met this standard of success, however there were fewer final exam questions devoted to this area than in years past, so question selection might have had something to do with the perfect success rate. We'd like to try incorporating a few more of these questions on next semester's final exam to ensure that this outcome is being adequately assessed.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

In the previous assessment report, I identified two things I'd like to change for future semesters: 1. Incorporate more hands-on probability activities 2. Have students practice identifying parts of 2D and 3D shapes prior to computing circumference, area, surface area, and volume. I think both of these changes have helped with student learning. The success rates were very good in the last report (all 82% and above) but they got even better this time around (89% and higher). I don't think the two changes are the only reasons why there was an improvement but I definitely think they have helped success rates in those outcomes.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

I've always thought that this course does well at meeting the needs of students and this assessment helped me confirm that. One thing that I did this time that I did not do in the last assessment, was compute a success rate for each question. This really helped me specifically identify where students were succeeding and where they were having more problems. Questions 6, 8 and 23 all had success rates in the 80s, and all others were in the 90s, so I'll definitely pay more attention to those topics when I'm teaching.

Overall, these students do very well compared to students in other math classes I teach. They are focused on their education goals and have excellent work habits, which greatly contributes to the high success rates.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

I will virtually meet with the other MTH 149 instructor in August 2021 to discuss the results. I will also share the results at our math department meeting in August 2021.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	Add more questions focusing on the concepts taught in Outcome #5 to the final exam.	In the current round of assessment, there were fewer final exam questions devoted to this area compared to previous years. Additional questions will ensure more accurate assessment.	2022
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Continue use of hands-on simulations and probability experiments;	These tools seem to be very effective in helping students' understanding of these concepts.	2022

	explore adding new online simulators.		
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Add more K-12 material focusing on line graphs and pictographs, focus less on stem-and-leaf plots.	These graphs seem to be more of a focus in K-5 classes recently. Students need to be prepared to address these. Stem-and-leaf plots do not appear often in K-5 classes and do not need as much of a focus.	2022
Other: Class assignments	Continue to provide/add practice on problem areas or difficult types of questions in Outcomes #3, 4.	Extra practice in class and through homework will help reinforce students' understanding of and ability to solve these types of questions.	2022

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

Assessment Results

Faculty/Preparer:	Nichole Klemmer	**Date:** 07/19/2021
Department Chair:	Lawrence David	**Date:** 07/20/2021
Dean:	Victor Vega	**Date:** 07/22/2021
Assessment Committee Chair:	Shawn Deron	**Date:** 12/02/2021

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	149	MTH 149 06/06/2017- Functional Math for Elementary Teachers II
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Mathematics	Nichole Klemmer
Date of Last Filed Assessment Report		

I. Assessment Results per Student Learning Outcome

Outcome 1: Solve problems using concepts related to counting and chance.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2013
    - Course section(s)/other population: All sections with a maximum of three sections. If enrollment exceeds three sections, then a stratified sample of 50% of the sections sorted by instructors will be used with a minimum of two sections selected.
    - Number students to be assessed: All students in selected sections
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
41	41

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess all outcomes. Questions related to this outcome were assessed using a rubric that was created by the math department.

0: (0%) The student does not attempt the problem.
1: (40%) The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
2: (60%) The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.
3: (80%) The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.
4: (100%) The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
36/41 or 88% of students scored a 3 or 4 on this outcome (equating to 80% or higher). The standard of success was met for this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Overall, students did very well on probability. They did exceptionally well on the basic probability problems, where they were asked to compute the probability of a single-stage experiment. They also did well answering questions on experimental probability.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The only part of probability that students struggled with is multi-stage experiments, particularly questions that involved two objects being picked out of a bucket and the first object was not replaced before the second pick. I plan on doing more hands-on experiments in future semesters so that students can visualize how the experiment is changing after the first pick is made. I will also model for students how to draw a picture on paper to illustrate this experiment so that they can use this strategy on assessments.

Outcome 2: Effectively represent and interpret data through graphs and measures of central tendency and dispersion.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2013
    - Course section(s)/other population: All sections with a maximum of three sections. If enrollment exceeds three sections, then a stratified sample of 50% of the sections sorted by instructors will be used with a minimum of two sections selected.
    - Number students to be assessed: All students in selected sections
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
41	41

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess all outcomes. Questions related to this outcome were assessed using a rubric that was created by the math department.

0: (0%) The student does not attempt the problem.
1: (40%) The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
2: (60%) The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.
3: (80%) The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.
4: (100%) The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
40/41 or 97.6% of all students scored a 3 or 4 on this outcome (equating to 80% or higher).

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

This was the highest rate of success out of all 5 outcomes, at 97.5%. Students did well on reading, creating, and interpreting all types of graphs.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The only area where some students made mistakes was on the computations for box-and-whisker plots. The mistakes were very minor and due to the large amounts of data. If even one number was misentered into the calculator, students would lose some points. The good news is that they all understood *how* to do the problems!

Outcome 3: Identify, illustrate, and apply various properties of 2- and 3-dimensional figures.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2013
    - Course section(s)/other population: All sections with a maximum of three sections. If enrollment exceeds three sections, then a stratified sample of 50% of the sections sorted by instructors will be used with a minimum of two sections selected.
    - Number students to be assessed: All students in selected sections
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
41	41

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess all outcomes. Questions related to this outcome were assessed using a rubric that was created by the math department.

0: (0%) The student does not attempt the problem.
1: (40%) The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
2: (60%) The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.
3: (80%) The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.
4: (100%) The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
32/41 or 78% of students scored a 3 or 4 on this outcome (equating to 80% or higher). The standard of success was met for this objective. This is the lowest success rate of all the objectives.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did very well answering questions on perimeter and area of two dimensional circles, quadrilaterals, and larger polygons. They also did very well answering questions on volume of three dimensional figures.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students struggled with identifying the base and height of a triangle. If they were only given one option, they could easily find the area of a triangle, but they struggled choosing the correct sides when all sides of the triangle were given. I plan on spending more time in future semesters on purely identifying the base and height of the triangle when given multiple options, before jumping into area.

Outcome 4: Use the properties of congruence and similarity to solve problems and execute simple constructions.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2013
    - Course section(s)/other population: All sections with a maximum of three sections. If enrollment exceeds three sections, then a stratified sample of 50% of the sections sorted by instructors will be used with a minimum of two sections selected.
    - Number students to be assessed: All students in selected sections
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
41	41

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess all outcomes. Questions related to this outcome were assessed using a rubric that was created by the math department.

0: (0%) The student does not attempt the problem.
1: (40%) The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
2: (60%) The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.
3: (80%) The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.
4: (100%) The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
38/41 or 92.7% of students scored a 3 or 4 on this outcome (equating to 80% or higher). The standard of success was met for this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did very well on this objective, at an almost 93% success rate. Their strengths were determining if two triangles are congruent or similar. They also did well using similarity and congruence statements to label triangles.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The only type of problem students struggled on was when there was a picture of a smaller triangle drawn inside of a larger triangle. Students had trouble visualizing the two triangles. Instead, they compared the smaller triangle with the trapezoid. To help students in future semesters overcome this problem, I will spend more time having students draw the two triangles in a separate picture before jumping into the computations.

Outcome 5: Use the English and Metric systems of measurement to calculate and/or convert measurements: linear, area, perimeter, surface area and volume.

- Assessment Plan
    - Assessment Tool: Common questions on a test
    - Assessment Date: Winter 2013
    - Course section(s)/other population: All sections with a maximum of three sections. If enrollment exceeds three sections, then a stratified sample of 50% of the sections sorted by instructors will be used with a minimum of two sections selected.
    - Number students to be assessed: All students in selected sections
    - How the assessment will be scored: Departmentally-created rubric
    - Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
    - Who will score and analyze the data: MTH 149 course leader

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2016	2017	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
41	41

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

All students assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All students assessed.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

The final exam was used to assess all outcomes. Questions related to this outcome were assessed using a rubric that was created by the math department.

0: (0%) The student does not attempt the problem.
1: (40%) The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
2: (60%) The student partially achieves the mathematical goal of the problem. A limited grasp of the main mathematical idea is demonstrated. Some of the work may be incomplete, misdirected or unclear.
3: (80%) The student substantially achieves the mathematical goal. The main thrust of the mathematics behind it is understood, but there may be some minor misunderstanding of content or errors in computation.
4: (100%) The student fully achieves the mathematical goal. All work is complete and correct.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

34/41 or 82.9% of students scored a 3 or 4 on this outcome (equating to 80% or higher). The standard of success was met for this outcome.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did very well converting Celsius to Fahrenheit and vice versa. They did well on simple conversions in the English system (inches to feet, pounds to ounces, seconds to hours...etc.) and simple conversions in the Metric system (cm to m, km to mm...etc.).

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The only area of struggle associated with this outcome was when units were squared or cubed. Some students had trouble jumping from 12 inches = 1 foot to 144 square inches = 1 square foot. This is pretty typical based on previous semesters. Like other objectives, I think students could benefit from more hands-on and visual exercises that help students SEE why units change when they are squared and cubed.

II. Course Summary and Action Plans Based on Assessment Results

1. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

After completing this assessment and reflecting on my teaching, I think WCC is doing a great job at meeting the needs of students in MTH 149. Most of the objectives (4 out of 5) had a success rate of over 82%, which is consistent with my own personal teaching goals and shows that students are understanding the vast majority of the concepts covered in the course.

The lowest objective, at 78%, was on 2 and 3 dimensional shapes. To be honest, I was not surprised to see that this was the lowest success rate. Students struggle identifying the necessary parts of more complex 3 dimensional shapes and computing surface area and volume. That being said, students still understood most of the concepts within this outcome, so I still think we are successful in teaching in this area.

2. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

As the course mentor, I plan on sharing this information with the other teachers who teach this course during our inservice meeting. Even though all objectives were considered met, other teachers will definitely benefit from learning about the assessment and the specific areas of strength and weakness.

3. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
No changes intended.			

4. Is there anything that you would like to mention that was not already captured?

5.

III. Attached Files

Assessment Data

Faculty/Preparer:	Nichole Klemmer	**Date:** 07/27/2017
Department Chair:	Lisa Rombes	**Date:** 07/31/2017
Dean:	Kristin Good	**Date:** 08/01/2017
Assessment Committee Chair:	Michelle Garey	**Date:** 10/24/2017

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	149	MTH 149 04/11/2013-Functional Math for Elementary Teachers II
Division	Department	Faculty Preparer
Math, Science and Health	Mathematics	Nichole Klemmer
Date of Last Filed Assessment Report		

I. Assessment Results per Student Learning Outcome

Outcome 1: Students will solve problems using concepts related to counting and chance.

- Assessment Plan
  - Assessment Tool: Common questions in an evaluation setting.
  - Assessment Date: Fall 2009
  - Course section(s)/other population: At least 2 sections taught by different instructors; randomly selected
  - Number students to be assessed: 25-60
  - How the assessment will be scored:
  - Standard of success to be used for this assessment:
  - Who will score and analyze the data:

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2012	2012	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
69	50

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

I chose a random sample of 50 students from all Winter and Fall 2012 sections of MTH 149.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All populations were included in the sample. Tests were compiled from every section of MTH 149 that was offered during the Fall and Winter semesters of 2012. They were shuffled, and 50 exams were randomly removed out of the 69 tests. Nichole Klemmer was the only instructor during those semesters, so all exams were from her students.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

There were two final exam questions assessing this outcome. The first question assessed students' understanding of probability trees. The second question assessed students' understanding of sample space, outcomes, and multiplication and addition rules.

After students' names were removed from the tests, both questions were scored out of 4 points using the math department rubric. A score of 4 indicates that a student fully achieved the mathematical goal and that all work was present and correct. A score of 3 indicates that a student substantially acheives the mathematical goal. Points may have ben lost due to a minor calculation error. The lowest possible score is 0, which indicates that the student did not attempt the problem.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

The mean score for outcome 1 was 3.35/4, or approximately 84%. All students attempted questions relating to outcome 1, so no scores of 0 were factored into the mean. Success is defined as more than 75% of students scoring a 3 or a 4. Since 87% of students scored a 3 or a 4 on objective 1, the standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Overall, students did very well on this outcome. 87% of students understood the main mathematical goal of the problems assessing this outcome.

8. Based on your analysis of student performance, discuss the areas in which student

achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Of the 13% of students who did not demonstrate understanding of this outcome, many may have had difficulty with the wording of the questions, particularly the second question regarding sample space of tossing a coin four times. If students were not able to come up with the sample space (part a), then it would have been impossible for them to answer probability questions regarding the experiment (parts b-d). In the future, the final exam question will be changed so that students will be able to demonstrate their knowledge of probability separately from their knowledge of drawing trees and identifying the sample space of an experiment.

Outcome 2: Students will effectively represent and interpret data through graphs and measures of central tendency and dispersion.

- Assessment Plan
    - Assessment Tool: Common questions in an evaluation setting.
    - Assessment Date: Fall 2009
    - Course section(s)/other population: At least 2 sections taught by different instructors; randomly selected
    - Number students to be assessed: 25-60
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2012	2012	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
69	50

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

I chose a random sample of 50 students from all Winter and Fall 2012 sections of MTH 149.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All populations were included in the sample. Tests were compiled from every section of MTH 149 that was offered during the Fall and Winter semesters of 2012. They were shuffled and 50 exams were randomly removed out of the 69 tests. Nichole Klemmer was the only instructor during those semesters, so all exams were from her students.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

There were three final exam questions assessing this outcome. The first question assessed students' understanding of mean, median, and mode. The second question assessed students' understanding of stem-and-leaf plots. The third question assessed students' understanding of box-and-whisker plots. After students' names were removed from the tests, questions were scored out of 4 points using the math department rubric. A score of 4 indicates that a student fully achieved the mathematical goal and that all work was present and correct. A score of 3 indicates that a student substantially acheives the mathematical goal. Points may have ben lost due to a minor calculation error. The lowest possible score is 0, which indicates that the student did not attempt the problem.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Students did the best on this outcome. The mean score for outcome 2 was 3.8/4, or approximately 95%. Only 1 student out of 50 did not attempt one of these problems. Success is defined as more than 75% of students scoring a 3 or a 4. Since 99% of students scored a 3 or a 4 on objective 2, the standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did very well on outcome 2. Almost all (99%) of students demonstrated an understanding of this outcome. The first question assessing this outcome required lower-level understanding/remembering of facts (mean, median, mode and range), so I wasn't surprised that students did well on this question. The last two questions, however, required students to create graphs and analyze the results

which made them more difficult. Students also did well on these questions. Out of all 5 outcomes, students showed the greatest understanding of outcome 2.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

In the future, I plan on requiring students to do even more analysis when it comes to data problems. Students will be asked to analyze the data in the mean, median, mode, and range problem on the final exam.

Outcome 3: Students will identify, illustrate, and apply various properties of 2- and 3-dimensional figures.

- Assessment Plan
    - Assessment Tool: Common questions in an evaluation setting.
    - Assessment Date: Fall 2009
    - Course section(s)/other population: At least 2 sections taught by different instructors; randomly selected
    - Number students to be assessed: 25-60
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2012	2012	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
69	50

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

I chose a random sample of 50 students from all Winter and Fall 2012 sections of MTH 149.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All populations were included in the sample. Tests were compiled from every section of MTH 149 that was offered during the Fall and Winter semesters of 2012. They were shuffled and 50 exams were randomly removed out of the 69 tests. Nichole Klemmer was the only instructor during those semesters, so all exams were from her students.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

There were two final exam questions assessing this outcome, but I graded them as 6 separate parts so I could identify the specific areas that students needed to work on. The first question assessed students' understanding of perimeter and area of a rectangle (2 parts). The second question assessed students' understanding of circumference, area, surface area, and volume of a cylinder (4 parts). After students' names were removed from the tests, both questions were scored out of 4 points using the math department rubric. A score of 4 indicates that a student fully achieved the mathematical goal and that all work was present and correct. A score of 3 indicates that a student substantially acheives the mathematical goal. Points may have ben lost due to a minor calculation error. The lowest possible score is 0, which indicates that the student did not attempt the problem.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
The mean score for outcome 3 was 3.34/4, or approximately 84%. There were 34 scores of 0 factored into the mean, representing 34 problems not being attempted. Using the mean in this case is not very helpful. Success is defined as more than 75% of students scoring a 3 or a 4. Since 81% of students scored a 3 or a 4 on objective 3, the standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did well on this outcome. 81% of students showed an understanding of 2-dimensional and 3-dimensional figures and their properties. Students did much better on the area and perimeter problem (of a 2D rectangle), compared to the circumference, surface area, volume problem (of a 3D cylinder).

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Even though the standard of success was met for this outcome, student success may have been greater if the second question was revised. The second question, which asked for volume, surface area, area of the base, and circumference of the base of a cylinder, did not have a designated space for students to put their answers. Although students should be able to read the question and identify what information is being asked of them, many students did not complete one or more of the calculations. It appeared as if they just missed that part of the question entirely, as opposed to not understanding how to do it. In the future, there will be specific blanks available for each answer so that students do not leave anything out.

Outcome 4: Students will use the properties of congruence and similarity to solve problems and execute simple constructions.

- Assessment Plan
    - Assessment Tool: Common questions in an evaluation setting.
    - Assessment Date: Fall 2009
    - Course section(s)/other population: At least 2 sections taught by different instructors; randomly selected
    - Number students to be assessed: 25-60
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2012	2012	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
69	50

3. If the number of students assessed differs from the number of students enrolled,

please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

I chose a random sample of 50 students from all Winter and Fall 2012 sections of MTH 149.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All populations were included in the sample. Tests were compiled from every section of MTH 149 that was offered during the Fall and Winter semesters of 2012. They were shuffled and 50 exams were randomly removed out of the 69 tests. Nichole Klemmer was the only instructor during those semesters, so all exams were from her students.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

There were two final exam questions assessing this outcome. The first question assessed students' understanding of similar triangles. The second question assessed students' understanding of the properties of congruent triangles. After students' names were removed from the tests, both questions were scored out of 4 points using the math department rubric. A score of 4 indicates that a student fully achieved the mathematical goal and that all work was present and correct. A score of 3 indicates that a student substantially acheives the mathematical goal. Points may have ben lost due to a minor calculation error. The lowest possible score is 0, which indicates that the student did not attempt the problem.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
The mean score for outcome 4 was 3.71/4, or approximately 93%. All students attempted these problems. Success is defined as more than 75% of students scoring a 3 or a 4. Since 91% of students scored a 3 or a 4 on objective 4, the standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students did well on this outcome, particularly with the similar triangles problem. 91% of students showed an understanding of similar and congruent figures and their properties which is pretty impressive.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Out of the two questions, students had more trouble with the congruence problem. Part of it could have been due to the nature of the question. Students had to determine if two triangles were congruent (yes/no answer) and state the congruence property if so. In the future, the final exam will have more questions asking about congruence. The questions themselves will require a deeper type of understanding (other than a yes/no question, requiring only basic remembering and understanding) so that students can demonstrate their knowledge in a variety of ways.

Outcome 5: Students will use the English and Metric systems of measurement to calculate and/or convert measurements: linear, area, perimeter, surface area and volume.

- Assessment Plan
    - Assessment Tool: Common questions in an evaluation setting.
    - Assessment Date: Fall 2009
    - Course section(s)/other population: At least 2 sections taught by different instructors; randomly selected
    - Number students to be assessed: 25-60
    - How the assessment will be scored:
    - Standard of success to be used for this assessment:
    - Who will score and analyze the data:

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2012	2012	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
69	50

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

I chose a random sample of 50 students from all Winter and Fall 2012 sections of MTH 149.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All populations were included in the sample. Tests were compiled from every section of MTH 149 that was offered during the Fall and Winter semesters of 2012. They were shuffled and 50 exams were randomly removed out of the 69 tests. Nichole Klemmer was the only instructor during those semesters, so all exams were from her students.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

There was one final exam question assessing this outcome. This question assessed students' understanding of conversions. There were three parts, each one addressing a different type of conversion: temperature (degrees Celsius to Fahrenheit), Metric system (km to cm), and English system of measurement (mi/hr to ft/min).

After students' names were removed from the tests, both questions were scored out of 4 points using the math department rubric. A score of 4 indicates that a student fully achieved the mathematical goal and that all work was present and correct. A score of 3 indicates that a student substantially acheives the mathematical goal. Points may have ben lost due to a minor calculation error. The lowest possible score is 0, which indicates that the student did not attempt the problem.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

The mean score for outcome 5 was 3.24/4, or approximately 81%. All students attempted these problems. Success is defined as more than 75% of students scoring a 3 or a 4. Since 80% of students scored a 3 or a 4 on outcome 5, the standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students' biggest strength regarding outcome 5 was their understanding of temperature conversion. Very few students got this part of the question incorrect.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Students' biggest weakness regarding outcome 5 was their understanding of Metric conversion and English conversions. Most concerning is the metric conversion problem since it only required students to move the decimal. The English conversion problem required students to perform dimensional analysis with several conversion factors, making it a much harder problem. Although technically the standard of success was met, students could improve in these areas.

II. Course Summary and Action Plans Based on Assessment Results

1. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

After grading and analyzing the results, I was pleasantly surprised with how well the course seemed to be meeting the needs of students. The outcome with the lowest percentage of student understanding was outcome 5, and even that outcome had an 80% understanding rate. The one surprising piece of data was the high number of students who did not attempt the volume/surface area problem corresponding with objective 3. The process of compiling and analyzing the final exam data by question really convinced me that this was a question that needs to be revised.

2. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

I have already shared this information with the instructors who will be teaching this course next semester. They are aware of students' strengths and weaknesses and the changes that will be occurring on the final exam. This information will be available to any other departmental faculty members who are interested in learning more about MTH 149.

3. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	I will be changing	I believe some	2013

	several questions on the final exam. Outcome 1: The questions will be broken up into subcategories so that one wrong answer on the first part, does not prevent students from moving on to the subsequent parts. Outcome 2: The mean/median/mode question will be revised so that students must analyze the results. Outcome 3: The structure of the problem will be revised so that students have a designated space for each answer.	students may have been getting these questions wrong on the final due to poor wording or question structure, rather than the content itself.	

4. Is there anything that you would like to mention that was not already captured?

III. Attached Files

MTH 149 Assessment Data
Final Exam Rubric

Faculty/Preparer: Nichole Klemmer **Date:**4/12/13
Department Chair: Kristin Good **Date:**4/15/13
Dean: M. Showalter **Date:**4/15/13
Assessment Committee Chair: _____ **Date:**_____