

**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.	
<b>0:</b> (0%)	The student does not attempt the problem.
<b>1:</b> (40%)	The student makes little progress toward accomplishing the goal of the problem because of lack of understanding or lack of effort.
<b>2:</b> (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.
<b>3:</b> (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.
<b>4:</b> (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)
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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.

<b>0:</b> (0%) The student does not attempt the problem.
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<b>3:</b> (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.
<b>4:</b> (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
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  - 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.

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2016	2017	

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

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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.

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

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<b>4:</b> (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.

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  - 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).
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<b>4:</b> (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
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    - Assessment Date: Winter 2013
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    - 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
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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.
<b>0:</b> (0%) The student does not attempt the problem.
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<b>2:</b> (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.
<b>3:</b> (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.
<b>4:</b> (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 achieves the mathematical goal. Points may have been 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)
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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 achieves the mathematical goal. Points may have been 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:

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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 achieves the mathematical goal. Points may have been 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
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  - Number students to be assessed: 25-60
  - How the assessment will be scored:
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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 achieves the mathematical goal. Points may have been 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 achieves the mathematical goal. Points may have been 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.

- 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

- 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.

- 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.

- Intended Change(s)

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

	<p>several questions on the final exam.</p> <p>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.</p> <p>Outcome 2: The mean/median/mode question will be revised so that students must analyze the results.</p> <p>Outcome 3: The structure of the problem will be revised so that students have a designated space for each answer.</p>	<p>students may have been getting these questions wrong on the final due to poor wording or question structure, rather than the content itself.</p>	
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4. Is there anything that you would like to mention that was not already captured?

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### 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:** \_\_\_\_\_