Compound Inequalities

- \( x \leq -2 \) OR \( x > 2 \)

- \(-3 < x \leq 2\)

By Audra Rehbaum
## Final Learning Experience

<table>
<thead>
<tr>
<th>Contact Information</th>
</tr>
</thead>
</table>
| **Residing Address** | Audra Rehbaum  
|                     | 55 Meadow Lane  
|                     | Buffalo, NY 14223 |
| **Phone Numbers**   | Home- 716-877-8194  
|                     | Cell- 716-870-8037 |
| **Email**           | arehbaum@daemen.edu |

<table>
<thead>
<tr>
<th>School Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grade Level Instructed</strong></td>
</tr>
<tr>
<td><strong>Content Area addressed within LE</strong></td>
</tr>
<tr>
<td><strong>School District</strong></td>
</tr>
<tr>
<td><strong>Specific School within District</strong></td>
</tr>
</tbody>
</table>
| **School Address** | 3980 Main Street  
|                     | Amherst, NY 14226 |

**Title of Learning Experience:** Solving Compound Inequalities

**NYS Standards/Performance Indicators:**

**MST Standard 3 Mathematics – Algebra Strand**

Students will understand the concepts of and become proficient with the skills of mathematics; communicate and reason mathematically; become problem solvers by using appropriate tools and strategies; through the integrated study of number sense and operations, algebra, geometry, measurement, and statistics and probability.

- Equations and Inequalities - Students will perform algebraic procedures accurately.
  - A.A.24 – Solve linear inequalities in one variable.

**Elementary/Beginning Level**  Intermediate  **Commencement**  Alternate/Students with Disabilities
Learning Context

Purpose/Rationale for Learning Experience:
The purpose of this lesson is for the students to be able to solve compound inequalities and graph them on a number line. These skills are practical for solving and representing real life problems, for which a general understanding of compound inequalities is necessary. Compound inequalities are used regularly to talk about a range of things such as time, money, temperature, weight, age, etc. The students will be able to interpret a word problem and write a compound inequality that represents the given information.

Enduring Understanding(s):
Students should be able to evaluate and solve any compound inequality. They should recognize and understand the language given in a word problem and how to represent the information in a linear compound inequality. They should also be able to represent the compound inequalities on a number line.

Essential Question(s):
- What is one method that we can use to represent a range of data?
- What is an example of how we could use or solve compound inequalities in the world?

Guiding Questions:
- What is a compound inequality?
- What are other phrases that mean the same thing as: “less than”, “greater than”, “less than or equal to”, or “greater than or equal to”?
- How and when do you combine two inequalities?
- When do you flip the inequality symbol?
- When do you use an open/closed circle on a number line?
- What does inclusive mean?
- How do you represent a compound inequality on a number line?
- What is the difference between an ‘and’ statement and an ‘or’ statement?

Overview of what students need to know/ be able to do in order to succeed:

Prior to Learning Experience:
The students in this 8th grade class are in advanced math. They are taking Integrated Algebra, which is a 9th grade curriculum. These students are expected to follow all classroom rules and procedures. In order for the class to run smoothly, it is especially important that the students: follow the teacher’s directions immediately, return classroom materials to their proper places, take out their homework upon entering the classroom and wait quietly in their seats for the teacher to check it, and are responsible for making up any missed work. Prior to this learning experience, the students should be able to solve multistep inequalities in one variable. They should be able to graph simple inequalities on a number line, and should know when to use an open or a closed circle.
During the Implementation of the Learning Experience:

During this learning experience, students should be able to see the connection between basic linear inequalities and linear compound inequalities. They should be able to see the difference and relationship between the two, in both the written and graphic forms.

After the Implementation of the Learning Experience:

After this learning experience, students should be able to solve compound inequalities. They should understand the differences between regular inequalities and compound inequalities. The students should be able to write a compound inequality based on information given in a word problem. They will be able to solve and graph all compound inequalities.

Key Subject-Specific Vocabulary:

- **Linear Inequality** - An inequality of the first degree (graph is a straight line).
- **Compound Inequality** - two or more simple inequalities joined by ‘and’ or ‘or’.
- **Inclusive** - including the specified extremes or limits as well as the area between them (uses the greater than or equal to, ≥, and less than or equal to symbols, ≤).
- **“More than”** - uses a greater than symbol (x >)
- **“Less than”** - uses a less than symbol (x <)
- **“As much as”** - uses a less than or equal to symbol (x ≤)
- **“As little as”** - uses a greater than or equal to symbol (x ≥)
- **“At most”** - uses a less than or equal to symbol (x ≤)
- **“At least”** - uses a greater than or equal to symbol (x ≥)
- **“Or more”** - uses a greater than or equal to symbol (x ≥)
- **“Or less”** - uses a less than or equal to symbol (x ≤)

Congruency Table:

<table>
<thead>
<tr>
<th>New York State Learning Standard: MST</th>
<th>MST Standard: Mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Standard: Standard 3</td>
<td>Content Strand: Algebra Strand</td>
</tr>
<tr>
<td>Band: Equations and Inequalities - Students will represent and analyze algebraically a wide variety of problem solving situations.</td>
<td>Level: Integrated Algebra (advanced 8th grade class)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance Indicators/Core Guide Information</th>
<th>Instructional Task (What the standards mean in your own words)</th>
<th>Learning Objectives</th>
<th>Student Work</th>
<th>Assessment Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.A.24 – Solve linear inequalities in one variable</td>
<td>Students will be able to solve any linear compound inequality in one variable. They will be able to perform the correct method for isolating the variable. The students will learn what inclusive means, and how it is applied in linear compound inequalities. The students will learn key words that appear in word problems, and how to interpret their meaning in reference to an inequality. The students will be able to write the linear compound inequality shown on a number line. They will also be able to graph compound given inequalities on a number line.</td>
<td>Students will be able to solve any one variable, linear compound inequality. They will be able to translate information from a given word problem in to a linear compound inequality. Students will also be able to graph linear compound inequalities on a number line.</td>
<td>During the class the teacher will give notes and model example problems of linear compound inequalities. The students will complete all class work in a packet that they were given at the beginning of the chapter. The students will practice solving linear compound inequality problems through guided practice and independently practice. The students will be assigned homework from the book. The next day the students will work on a worksheet during class that will be graded. On this day, the students will be given more individual help if needed. Questions involving linear compound inequalities will appear on the final assessment.</td>
<td>The Solving Compound Inequalities: Rubric (pg. 7) will be used when grading the “Solving Compound Inequalities” worksheet. In order for the students to receive full credit when writing linear compound inequalities, they must correctly interpret the verbal sentences and write the proper inequality to represent the information. To receive full credit for graphing the linear compound inequalities, the students must correctly solve the linear compound inequalities, and graph the inequalities correctly on the number line.</td>
</tr>
</tbody>
</table>
Assessment Plan

This learning experience will take place at the end of a unit on solving linear inequalities. On the day before beginning this lesson on compound inequalities, the students will take a short quiz on solving linear inequalities (pg. 8). This will also serve as a diagnostic assessment, so that the teacher can measure their skills of solving regular inequalities. It is important that the students understand the previously taught information because compound inequalities significantly relies on prior knowledge.

Students are formatively assessed through observation, student participation, a homework assignment, and a “Solving Compound Inequalities” worksheet (pg. 5a) that will be completed in class during the second day. Homework is not graded, but is checked for completion. The “Solving Compound Inequalities” worksheet will be collected and graded. The students will be given a rubric with the worksheet (pg. 7), which will inform them of the criteria that is expected in order for them to receive full credit.

Compound inequalities will be one of the topics assessed on the unit test. The students will need to know how to solve and graph all linear inequalities in one variable. They will need to be able to interpret a word problem and write a linear inequality that represents it. This assessment is part of the “Tests and Quizzes” section of the grades for the semester, which, according to school rules, will affect 50% of the students’ grades. The students will be given another rubric (pg. 7) the day before the test that will fully explain the teacher’s expectations of the students. It is the same rubric that was used for the “Solving Compound Inequalities” worksheet. The teacher will also tell the students the point values of each section of the test. If the students follow the directions and demonstrate that they completely understand the material, they will receive full credit. This test will be used as a summative assessment.
### Solving Compound Inequalities: Rubric

Student Name: ________________________________

<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Writing the linear</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>compound inequality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Worksheet:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Weight: .25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Weight: .50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The student correctly interprets the verbal sentence and writes the proper <strong>inequality</strong> to represent the information.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The student writes the <strong>inequality</strong> with signs facing the correct way. However, they incorrectly write whether it is inclusive statement or not.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The student does not answer the question correctly at all.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Solving and graphing the linear compound inequality |   |   |   |   |   |
| **Worksheet:** |   |   |   |   |   |
| (Weight: .25) |   |   |   |   |   |
| **Test:** |   |   |   |   |   |
| (Weight: 1) |   |   |   |   |   |
| The student correctly **solves the linear compound inequality** and graphs the **inequality** correctly on the number line. | | | | | |
| The student makes one of the following mistakes: | | | | | |
| an algebraic mistake when **solving the inequality**, or does not use the correct **inequality** symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line. | | | | | |
| The student makes two of the following mistakes: | | | | | |
| an algebraic mistake when **solving the inequality**, or does not use the correct **inequality** symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line. | | | | | |
| The student makes three of the following mistakes: | | | | | |
| an algebraic mistake when **solving the inequality**, or does not use the correct **inequality** symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line. | | | | | |
| The student does not answer this question correctly at all. | | | | | |

**Total Worksheet Score:** _____

**Comments:**
Student Work

These students are in an 8th grade advanced math course. This course teaches the 9th grade Integrated Algebra curriculum. Though all of the students in this course excel in mathematics, the students do have a range of ability levels. Some of the students understood the new material presented in this LE immediately, yet others had to work hard to understand it.

The first piece of student work is the quiz (pre-assessment). I did not actually give this quiz to the students, but I would use it if I taught this lesson in the future. Thus, I do not have results for the quiz. This pre-assessment would allow me to decide if the students are ready to learn the new material, or if they need to review basic linear inequalities more.

Name: ___________________________  Class 8-Algebra
Chapter 3 Quiz: Inequalities

1. Graph:  \( 2 < x \)

2. Write the inequality: “a number increased by 2 is more than 5”

3. Solve and Graph:  \( 2x + 1 \leq -x - 5 \)

Name: ____ Key _________  Class 8-Algebra
Chapter 3 Quiz: Inequalities

4. Graph:  \( 2 < x \)

5. Write the inequality: “a number increased by 2 is more than 5”

\[ x + 2 > 5 \]

Solve and Graph:  \[ 2x + 1 \leq -x - 5 \]
\[ 2x + x \leq -5 - 1 \]
\[ 3x \leq -6 \]
\[ x \leq -2 \]
The next section of student work is the homework and the “Solving Compound Inequalities” worksheet. The homework is reviewed at the beginning of class. The teacher shows the students the correct answers to the assigned questions, and reviews any questions that the students want help on. After reviewing the homework, the students are given the “Solving Compound Inequalities” worksheet to complete during class. It is collected at the end of class and taken for a Class Work grade. During class the students are allowed to work alone or in partners. They are allowed to ask the teacher questions, as well as use their notes and their textbooks for help.

The majority of the students score very well on the “Solving Compound Inequalities” worksheet (see scores below). Some of the worksheets that were handed in to be graded were messy and appeared to be rushed work. The students who scored in the developing stages made several minor errors that they normally would not have made. Based on observation of their work in the previous day of the LE and on the final assessment, I feel that the students who scored in the developing stage did not put in the time or effort into completing this assignment.

<table>
<thead>
<tr>
<th>Solving Compound Inequalities: Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>18</td>
</tr>
</tbody>
</table>

Distinguished | Proficient | Developing

X = one student

The last piece of student work that students will be assessed on is the chapter test. This test will measure the students understanding of regular linear inequalities as well as linear compound inequalities which were taught during this learning experience. I was very pleased with this piece of student work because all of the students received full credit or lost at most two points on this portion of the final assessment. I did not collect data on this assessment because the final scores of the test were based on several different learning objectives, not only those taught during this LE.

**Procedure**
Prior to Day One of this Learning Experience, the students are given a quiz on the material from the beginning of the chapter. This is used as a pre-assessment (*diagnostic assessment*). This Learning Experience builds on everything learned in the previous lessons of this chapter.

**Day 1:**
**Anticipatory Set**- The students receive their graded quizzes (*diagnostic assessment*) and are given a couple of minutes to look over their mistakes. If they have questions the teacher can spend up to 5 minutes going over the quiz. The teacher begins today’s lesson by asking the students to give her a real-life example of an inequality. An acceptable example would be, “I have more than $10.” The teacher takes the example they give her and adds on to it, so that it becomes an example of a compound inequality. The original example may be modified to, “I have more than $10, but I have less than $25.” The teacher explains that this is called a compound inequality.
**Input/Modeling**- The students take out their packets that they have been using for the entire chapter, and use them to take notes on today’s lesson. The teacher will be writing the notes as well, using the overhead projector. The teacher gives the students the definition of a compound inequality. Then she gives them 2 examples, an ‘AND’ statement and an ‘OR’ statement.

\[ x \geq 2 \ AND \ x < 5 \ can \ be \ written \ as \ 2 \leq x < 5 \quad x < 3 \ OR \ x > 6 \]

The teacher models how to solve linear compound inequalities and explains how solving them differs from regular linear inequalities.

<table>
<thead>
<tr>
<th>Linear inequality</th>
<th>Linear Compound Inequality (AND statement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(x + 1 &gt; 7)</td>
<td>(5 &gt; x + 1 &gt; 7)</td>
</tr>
<tr>
<td>(-1)</td>
<td>(-1)</td>
</tr>
<tr>
<td>(x &gt; 6)</td>
<td>(4 &gt; x &gt; 6)</td>
</tr>
</tbody>
</table>

Then she tells the students, in steps, how they can graph the compound inequalities. Lastly, the teacher models how to write the compound inequalities based on a graph or a word problem.

**Guided Practice**- After each question the teacher models, she presents another question and calls on students to walk her through the steps for solving it. The teacher asks prompting questions to help guide them through the process of solving the problems.

**Independent Practice**- The teacher assigns homework out of the text book (Holt: Algebra 1, 2008. p. 206). The students are expected to complete the homework for the next class. The questions are similar to the questions completed during class, including a couple of more challenging ones.

**Closure**- At the end of the lesson, the teacher asks the students the essential questions that were given at the beginning of class. She randomly calls on students for answers. Every student should be able to answer each question.

**Day 2:**

**Anticipatory Set**- At the beginning of class, the teacher gives the students answers to the homework assignment. The students check their work and are allowed to ask questions on some of the problems. Homework review should not take more than 10-15 minutes. Then, the teacher asks the class to think of an example of a real-world compound inequality. She calls on a student for an answer and the class is asked how to write the inequality. The teacher writes the correct inequality on the board. Then she verbally changes the problem slightly, and asks the students how to algebraically solve the inequality.

**Guided Practice**- For the rest of class the students work independently or in pairs to complete the “Solving Compound Inequalities” worksheet (see attachments 5 & 6). The teacher is walking around the class room to help them if they need it or give guidance if they appear to be struggling. The worksheet is collected at the end of class and is taken as a Class Work grade and used as a formative assessment. They are graded and returned the next day.
**Independent Practice**- For homework, the students are assigned questions from the Study-Guide, chapter review, from their text-book (Holt: Algebra 1, 2008. p. 216-219). This assignment helps the students to prepare for the chapter test on inequalities. The students are able to use this as a method to self-assess their skills. Compound Inequalities are only one of the skills assessed on the chapter test.

**Closure**- The students are told that next class will be a review day and that the following day will be a chapter test. The teacher explains to them that they should be prepared to ask questions on anything they are struggling with. She reminds students that she is also available after school for additional help.

**Day 3:**
**Anticipatory Set**- The teacher reviews with the students the rubric and point scale that will be used on the test the next day.

**Input/Modeling/Guided Practice**- The teacher first goes over the chapter review that was assigned for homework the previous night. She calls on students to for input on solving the problems that their peers struggled with. The teacher reviews any material that the students have questions on. The teacher also gives the students several example problems, similar to those that will appear on the test.

**Independent Practice**- The students study for their test by looking over their notes. They should practice some problems from their text-book (taken from each section of the chapter), without looking at their notes. This allows them to see if they are able to answer the questions on the test. They may also want to re-do problems that had previously been assigned for homework.

**Closure**- The teacher gives the students good test preparation suggestions, such as where to get practice problems (see independent practice above). The teacher tells the students to get a good night sleep and have breakfast in the morning.

**Day 4:**
**Assessment**- Today the students complete a test, “Chapter 3 Test: Solving Inequalities,” which is used as a summative assessment. The test assesses every concept taught throughout the chapter on inequalities. However, material from this Learning Experience is a large portion of the test. The portion of the test that assesses the material taught throughout this LE is included in the attachments (see attachment 5b). The rubric that is included (pg. 7) is used to score the “Solving Compound Inequalities” worksheet, not the summative assessment.

**Resources and Materials Required for Instruction**

**References:**
- www.regentsprep.org
Supplies:
- Chapter 3: Notes/Work packets
- Writing Utensils
- Textbook
- Overhead Projector
- Transparency of notes (pages from packet)
- Quiz (diagnostic assessment)
- Solving Compound Inequalities Worksheet (formative assessment)
- Chapter test (summative assessment)

Teacher Exemplar

The teacher exemplars for the formative and summative assessments are copies of the actual assessments, with the correct answers printed on them. Therefore the teacher exemplar will not be given to the students, for either the formative or the summative assessments, because it would give the students the answers to the questions. The students will be given the rubric the day before the test that will be used to grade each question. The students will also be informed in advance, of the point value of each question. The teacher will write an example problem on the board, and model the work that should be shown in order to receive full credit.

Modification Table

This learning experience was taught at a private catholic school. Although some of the students do have learning disabilities, the students’ parents waived their rights to specific modification rights. However, modifications were made that would benefit all students.

<table>
<thead>
<tr>
<th>Modification Type</th>
<th>Specific Modification</th>
<th>Rationale</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental/Management</td>
<td>The students will have teacher-assigned seating arrangements. However, if a student is unhappy with their seat because they can’t see or they are distracted, the teacher will be willing to adjust the seat-arrangements.</td>
<td>The reason for giving assigned seats is to prevent the students from sitting with peers that they tend to be distracted by. Also, the students who tend to cause disruptions in class will be seated close to the front, so that the teacher proximity to the students will improve management.</td>
<td>The benefit of the teacher assigning seats is that she can create a comfortable environment for everyone that limits distractions and class disruptions. Well developed assigned seats should increase the amount of time-on-task so that the maximum amount of learning may take place.</td>
</tr>
<tr>
<td>Instructional</td>
<td>- The students will take notes and do problems in their work packets in their</td>
<td>- The students will keep their work packets in their</td>
<td>- The benefit of packets is that it allows the</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>work packets.</th>
<th>binders. They should bring them to class every day. The packets are useful because they decrease the amount of writing that the students and teacher have to do.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The teacher is available afterschool for help and is able to provide several extra practice problems.</td>
<td>• If the students need extra help, they may come after school for more individual instruction and will be given additional practice problems.</td>
</tr>
<tr>
<td>students to focus their time and energy on the actual math problems.</td>
<td>• The students who come for extra help will be given one-on-one help. They will also leave school feeling more comfortable and confident in their understanding of the material.</td>
</tr>
</tbody>
</table>

**Content/Material**

| The teacher will ask the students for examples of problems that were taught in previous lessons of the chapter. | This Learning Experience takes place at the end of a chapter, and will therefore significantly rely upon prior knowledge. The teacher will be able to use their examples to introduce the new content, so that there is a smooth transition. | Teaching this Learning Experience consecutively with the previous material of the chapter benefits the students because those concepts, which are the foundation of this Learning Experience, are fresh on their minds. The students only need to add a few extra steps to solve these new problems. |

**Tasks**

| The students will be given a rubric. If necessary, the students will be given extra time to complete the final test. | The rationale of giving a rubric is so that the students are aware of the teacher’s expectations. The rubric is made in | The students know all of the elements necessary for them to receive a perfect score. Also, it leaves no room for arguing |
The students will be allowed to do test corrections on the summative assessment.

great detail so that anyone who uses it will give the same grade.
The students will be given extra time to complete the assessment because it will also assess their reading comprehension skills in addition to their ability to solve the problems. Also, some students may have an IEP that automatically grants them extra time.
The rationale behind allowing students to do test corrections is that it allows the students to learn from their mistakes.
if a student is unhappy with their grade.
The benefit of allowing students extra test time is that, the students will not feel pressured. When under pressure, students tend to rush and make mistakes that they wouldn’t normally have made.
Students benefit from making test corrections because they receive more practice on the areas they did poorly on, and they will be less likely to make the same mistakes on the final exam for the year.

**Time Required**

**Planning:** about 6 hours

**Implementation:** Four 40 minute periods

**Assessment (per student):**
- 1-2 minutes for Quiz (*diagnostic assessment*)
- 10-15 minutes for homework (assessed as a whole class)
- 4-5 minutes for worksheet completed on day two (*formative assessment*)
- 40 minutes on review day (assessed as a whole class)
- 5-10 minutes for *summative assessment*

**Schedule/Unit plan:** This Learning Experience takes place during the last four days of the unit on solving linear inequalities. It consists of the last two days of new material on Compound Inequalities, followed by a review day, and a chapter test on the fourth day.
Reflection

This learning experience was designed to teach students about compound inequalities and their relevance in the real world. The students learned that compound inequalities are used regularly in life to talk about things such as money, temperature, etc. The students learned how to solve and graph compound inequalities on a number line. They also learned how to interpret meaning from word problems and create inequalities to represent the information. This learning experience built upon prior knowledge, but was a very new concept to the students.

Based on the scores on the formative and summative assessments, I feel that my teaching was effective. At the end of the learning experience, there was evidence that the students met my teaching objectives. The students are now able to apply their knowledge to real world problems and organize the given information in simple algebraic inequalities.

At the beginning of the learning experience the students seemed to be struggling. It was completely new material for them. However, the method finally made sense to them, after completing several example problems. The students learned that it takes practice to understand the meaning and use of compound inequalities. At the beginning of the lesson one student asked, “Why do we need to learn this? When will we ever use this outside of school?” I did give him a couple examples of when compound inequalities are used. However, a couple days later he commented on how natural it is for us to solve compound inequalities in every day life. He made a comment about how we generally solve compound inequalities in our head, but now he understands how we can put it in writing. Though we do regularly use compound inequalities in discussion, we don’t always need to write them in the form of an algebraic inequalities or graphs.

The peer review session, on November 12th, 2009 at Daemen College, was extremely useful to me in creating my final learning experience. After watching my peers present their learning experiences, I realized the areas of my learning experience that needed improvement. Also, after presenting my learning experience, my peers gave me very supportive and helpful comments, that helped me to improve. They gave suggestions on how to engage the students before the lesson. They also informed me that my rubric was not very clear and that a student may not receive the same score if someone else used my rubric to grade their work. One question they asked me was, “How do you decipher what deserves half off or a whole point off?” I modified my rubric by writing more specific criteria that I expected to see in student work. I also changed the rubric, so that could be used to score any assignment that assessed that performance indicator. I would truly like to thank my peer review group for their support and the warm and cool comments! Thank you: Laura, Michelle, Christine, Clay, Mike, as well as Mr. Arnold and Kim Charmatz!

I learned a lot while creating this learning experience. I can now see the great benefit of creating an adaptable, ever-changing, learning experience, and working with a peer-review group.
Appendices (attachments)

1. Introduction letter to parents
2. Classroom floor plan
3. Classroom rules
4. Classroom procedures
5. Teacher Exemplars and Rubric
   a. Worksheet
   b. Test
   c. Rubric
6. Student Work
   a. Distinguished
      i. Worksheet
      ii. Test
      iii. Rubric
   b. Proficient
      i. Worksheet
      ii. Test
      iii. Rubric
   c. Developing
      i. Worksheet
      ii. Test
      iii. Rubric
7. Blank Copy
   a. Worksheet
   b. Test
Introduction Letter to Parents

October 26, 2009

Dear Parents and/or Guardians,

My name is Audra Rehbaum, and I will be your child’s student teacher for the next seven weeks. I will be graduating from Daemen College with my undergraduate degree in Secondary Mathematics Education (grades 7-12) in January 2010. This is my second student teaching placement, after being at West Seneca East High School.

I just wanted to inform you that we will be teaching your child’s class starting next week and continuing until I leave on December 11th. I will be working closely with your child’s classroom teacher, Miss. Pilger, to plan many engaging lesson plans. I look forward to getting to know your child over the next several weeks.

If you have any questions, comments, problems, or concerns, feel free to contact me at any time. My cell phone is (716) 870-8037 and my email is arehbaum@daemen.edu.

I look forward to this great learning experience ahead of me!

Sincerely,

Miss Audra Rehbaum
Classroom Rules:

1. Take turns talking and sharing classroom resources.

2. Return classroom materials to their proper places.

3. Keep your hands, feet, and objects to yourselves.

4. Follow the teacher’s directions immediately.
Classroom Procedures

1. Upon entering the classroom, take out your homework from the previous night and wait quietly in your seat for the teacher to check that it was completed.

2. When leaving the classroom (after asking permission), bring your agenda to the teacher to be signed.

3. You are responsible for making up missed work if you were absent for any reason.
**Practice B**

**LESSON 3-6**

Solving Compound Inequalities

Write the compound inequality shown by each graph.

1. \(-2 < x < 4\)

2. \(x < -3\) \(\quad x \geq 3\)

3. \(x \leq -15\) \(\quad x \geq -8\)

4. \(0 \leq x < 20\)

Solve each compound inequality and graph the solutions.

5. \(-15 < x - 8 < -4\)

6. \(12 \leq 4n < 28\)

7. \(-2 \leq 3b + 7 \leq 13\)

8. \(x - 3 < -3\) \(OR\) \(x - 3 > 3\)

9. \(5k \leq -20\) \(OR\) \(2k \geq 8\)

10. \(2s + 3 \leq 7\) \(OR\) \(3s + 5 > 26\)

Write a compound inequality for each problem. Graph the solutions.

11. The human ear can distinguish sounds between 20 Hz and 20,000 Hz, inclusive.

\[20 \leq x \leq 20,000\]

12. For a man to box as a welterweight, he must weigh more than 140 lbs, but at most 147 lbs.

\[x > 140\] \(\quad x \leq 147\]

\[140 < x \leq 147\]
**Problem Solving**

**Lesson 3-6**

**Solving Compound Inequalities**

Write and solve an inequality for each situation.

1. The Mexican Tetra is a tropical fish that requires a water temperature between 68 and 77 degrees Fahrenheit, inclusive. An aquarium is heated 8 degrees so that a Tetra can live in it. What temperatures could the water have been before the heating?

   \[68 \leq x \leq 77\]

2. Nerissa's car can travel between 380 and 410 miles on a full tank of gas. She filled her gas tank and drove 45 miles. How many more miles can she drive without running out of gas?

   \[380 \leq x \leq 410\]

3. A local company is hiring trainees with less than 1 year of experience and managers with 5 or more years of experience. Graph the solutions.

   \[x < 1 \quad x \geq 5\]

4. Marty's allowance is doubled and is now between $10 and $15, inclusive. What amounts could his allowance have been before the increase? Graph the solutions.

   \[10 \leq x \leq 15\]

The elliptical orbits of planets bring them closer to and farther from the Sun at different times. The closest (perihelion) and farthest (aphelion) points are given for three planets below. Use this data to answer questions 5–7.

<table>
<thead>
<tr>
<th>Planet</th>
<th>Perihelion (in 10^9 km)</th>
<th>Aphelion (in 10^9 km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uranus</td>
<td>2741.3</td>
<td>3003.6</td>
</tr>
<tr>
<td>Neptune</td>
<td>4444.5</td>
<td>4545.7</td>
</tr>
<tr>
<td>Pluto</td>
<td>4435.0</td>
<td>7304.3</td>
</tr>
</tbody>
</table>

5. Which inequality represents the distances d from the sun to Neptune?

   - A \( d \leq 4444.5 \)
   - B \( d \leq 4545.7 \)
   - C \( 4444.5 \leq d \leq 4545.7 \)
   - D \( d = 4444.5 \) OR \( d \approx 4545.7 \)

6. A NASA probe is traveling between Uranus and Neptune. It is currently between their orbits. Which inequality shows the possible distance p from the probe to the Sun?

   - F \( 1542.1 < p < 1703.2 \)
   - G \( 2741.3 < p < 4545.7 \)
   - H \( 3003.6 < p < 4444.5 \)
   - J \( 7185.8 < p < 7549.3 \)

7. At what distances o do the orbits of Neptune and Pluto overlap?

   - A \( 4435.0 \leq o \leq 4444.5 \)
   - B \( 4435.0 \leq o \leq 4545.7 \)
   - C \( 4444.5 \leq o \leq 7304.3 \)
   - D \( 4545.7 \leq o \leq 7304.3 \)
Write the inequality

15) Today's temperature will be above 55°F, and not as high as 40°F.
   \[ 55 < t < 60 \]

16) Mary has been saving her money for months. She now has between $210 and $280, inclusive.
   \[ 210 \leq m \leq 280 \]

Solve the compound inequality and graph

17) \( g - 8 \geq -1 \) or \( 6 - g \geq 2 \)
   \[ g \geq 7 \quad \text{or} \quad \frac{a}{2} \geq -4 \]
   \[ g \leq -8 \quad \text{or} \quad a \leq -8 \]

18) \( u + 8 \geq 1 \) and \( u - 3 < 3 \)
   \[ u \geq -7 \quad \text{and} \quad u < 6 \]

Write, Solve, and Graph

19) Tammy wants to run at least 10 miles per week. So far this week she ran 4.5 miles. Write, solve, and graph an inequality to determine how many more miles Tammy must run this week to reach her goal.
   \[ x + 4.5 \geq 10 \]
   \[ x \geq 5.5 \]
<table>
<thead>
<tr>
<th>A.A.24</th>
<th></th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Writing the linear compound inequality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worksheet: (Weight: .25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test: (Weight: .50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Writing the linear compound inequality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worksheet: (Weight: .25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test: (Weight: 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Solving and graphing the linear compound inequality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worksheet: (Weight: .25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test: (Weight: 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

**Total Worksheet Score:** 18/18

---

**Student Name:** Key

**Solving Compound Inequalities: Rubric**
Practice B
Solving Compound Inequalities

Write the compound inequality shown by each graph.

1. \(-2 < x < 4\)

2. \(x > 3\) or \(x \geq 3\)

3. \(x \leq -15\) or \(x \geq -8\)

4. \(0 \leq x \leq 20\)

Solve each compound inequality and graph the solutions.

5. \(-15 < x - 8 < 4\)

6. \(12 \leq 4n < 28\)

7. \(-2 < 3b + 7 < 13\)

8. \(x - 3 < -3\) OR \(x - 3 \geq 3\)

9. \(5k \leq -20\) OR \(2k = 8\)

10. \(2s + 3 \leq 7\) OR \(3s + 5 > 26\)

Write a compound inequality for each problem. Graph the solutions.

11. The human ear can distinguish sounds between 20 Hz and 20,000 Hz, inclusive.

12. For a man to box as a welterweight, he must weigh more than 140 lbs, but at most 147 lbs.
**Problem Solving**

**3-6 Solving Compound Inequalities**

Write and solve an inequality for each situation.

1. The Mexican Tetra is a tropical fish that requires a water temperature between 68 and 77 degrees Fahrenheit, inclusive. An aquarium is heated 8 degrees so that a Tetra can live in it. What temperatures could the water have been before the heating?

   \[66 \leq x \leq 75\]

2. Nerissa’s car can travel between 380 and 410 miles on a full tank of gas. She filled her gas tank and drove 45 miles. How many more miles can she drive without running out of gas?

   \[335 \leq x \leq 385\]

3. A local company is hiring trainees with less than 1 year of experience and managers with 5 or more years of experience. Graph the solutions.

   \[y < 1 \text{ or } x \geq 5\]

4. Marty’s allowance is doubled and is now between $10 and $15, inclusive. What amounts could his allowance have been before the increase? Graph the solutions.

   \[5 \leq x \leq 7.5\]

The elliptical orbits of planets bring them closer to and farther from the Sun at different times. The closest (perihelion) and furthest (aphelion) points are given for three planets below. Use this data to answer questions 5–7.

<table>
<thead>
<tr>
<th>Planet</th>
<th>Perihelion (in 10^6 km)</th>
<th>Aphelion (in 10^6 km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uranus</td>
<td>2741.3</td>
<td>3003.6</td>
</tr>
<tr>
<td>Neptune</td>
<td>4444.5</td>
<td>4545.7</td>
</tr>
<tr>
<td>Pluto</td>
<td>4435.0</td>
<td>7304.3</td>
</tr>
</tbody>
</table>

5. Which inequality represents the distances \(d\) from the Sun to Neptune?
   - A. \(d \leq 4444.5\)
   - B. \(d = 4545.7\)
   - C. \(4444.5 \leq d \leq 4545.7\)
   - D. \(d = 4444.5 \text{ OR } d = 4545.7\)

6. A NASA probe is traveling between Uranus and Neptune. It is currently between their orbits. Which inequality shows the possible distance \(p\) from the probe to the Sun?
   - F. \(1542.1 < p < 1703.2\)
   - G. \(2741.3 < p < 4545.7\)
   - H. \(3003.6 < p < 4444.5\)
   - J. \(7185.8 < p < 7549.3\)

7. At what distances \(o\) do the orbits of Neptune and Pluto overlap?
   - A. \(4435.0 \leq o \leq 4444.5\)
   - B. \(4435.0 \leq o \leq 4545.7\)
   - C. \(4444.5 \leq o \leq 7304.3\)
   - D. \(4545.7 \leq o \leq 7304.3\)
Name:  [Blank]  
Class:  8A  

Chapter 3 Test: Solving Inequalities

Write the inequality

15) Today's temperature will be above 55°F, and not as high as 60°F.
   \[ 55^\circ F < t \leq 60^\circ F \]

16) Mary has been saving her money for months. She now has between $210 and $280, inclusive.
   \[ 210 \leq n \leq 280 \]

Solve the compound inequality and graph

17) \( g - 8 > -1 \) or \( 6 - g \geq 2 \)
   \[ g > 7 \quad \text{or} \quad g \geq 4 \]

18) \( u + 8 \geq 1 \) and \( u - 3 < 3 \)
   \[ -7 \leq u \leq 2 \]

Write, Solve, and Graph

19) Tammy wants to run at least 10 miles per week. So far this week she ran 4.5 miles. Write, solve, and graph an inequality to determine how many more miles Tammy must run this week to reach her goal.

\[ 4.5 + x \geq 10 \]
\[ x \geq 5.5 \]

Tammy must run at least 5.5 more miles.
### Solving Compound Inequalities: Rubric

<table>
<thead>
<tr>
<th>Student Name: Chelsea</th>
<th>Writing the linear compound inequality</th>
<th>Solving and graphing the linear compound inequality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Worksheet:</strong> (Weight: .25)</td>
<td><strong>Test:</strong> (Weight: .50)</td>
<td><strong>Test:</strong> (Weight: 1)</td>
</tr>
<tr>
<td><em>Example: Question 1 p49</em></td>
<td><em>Example: Question 10 p44</em></td>
<td></td>
</tr>
<tr>
<td><strong>A.A.24</strong></td>
<td><strong>4</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td><strong>Writing the linear compound inequality</strong></td>
<td>The student correctly interprets the verbal sentence and writes the proper <strong>inequality</strong> to represent the information.</td>
<td>The student makes one of the following mistakes:</td>
</tr>
<tr>
<td><strong>Worksheet:</strong></td>
<td></td>
<td>an algebraic mistake when solving the <strong>inequality</strong>, or does not use the correct <strong>inequality</strong> symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line.</td>
</tr>
<tr>
<td><strong>Test:</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Worksheet Score:** 18/18

**Comments:** Great job on this worksheet Chelsea! It is very clear to me that you took your time on this assignment, and made sure that you only handed in your very best work. Thank you!
LESSON 3-6
Solving Compound Inequalities

Practice B

Write the compound inequality shown by each graph.

1. 
\[-2 < x < 4\]

2. 
\[x < -3 \text{ or } x > 3\]

3. 
\[-\frac{1}{2} x > -15 \text{ or } x > -8\]

4. 
\[0 \leq x < 20\]

Solve each compound inequality and graph the solutions.

5. 
\[-15 < x + 8 < 4\]

6. 
\[12 \leq 4n < 28\]

7. 
\[-2 \leq 3b + 7 \leq 13\]

8. 
\[x - \frac{9}{10} < -3 \text{ OR } x - 3 \geq -\frac{3}{10}\]

9. 
\[k \leq -20 \text{ OR } k \geq 8\]

10. 
\[2s + \frac{3}{5} \leq 7 \text{ OR } 3s + \frac{5}{2} > 26\]

Write a compound inequality for each problem. Graph the solutions.

11. The human ear can distinguish sounds between 20 Hz and 20,000 Hz, inclusive.

\[20 \leq x \leq 20,000\]

12. For a man to box as a welterweight, he must weigh more than 140 lbs, but at most 147 lbs.

\[140 < x \leq 147\]
Problem Solving

3-6 Solving Compound Inequalities

Write and solve an inequality for each situation.

1. The Mexican Tetra is a tropical fish that requires a water temperature between 68 and 77 degrees Fahrenheit, inclusive. An aquarium is heated 8 degrees so that a Tetra can live in it. What temperatures could the water have been before the heating?

   \[60 \leq x \leq 69\]

2. Nerissa’s car can travel between 380 and 410 miles on a full tank of gas. She filled her gas tank and drove 45 miles. How many more miles can she drive without running out of gas?

   \[380 \leq x \leq 410\]

   \[335 \leq x \leq 365\]

3. A local company is hiring trainees with less than 1 year of experience and managers with 5 or more years of experience. Graph the solutions.

   \[x < 1 \quad x \geq 5\]

4. Marty’s allowance is doubled and is now between $10 and $15, inclusive. What amounts could his allowance have been before the increase? Graph the solutions.

   \[10 \leq x \leq 3.75\]

   \[5 \leq x \leq 7.5\]

The elliptical orbits of planets bring them closer to and farther from the Sun at different times. The closest (perihelion) and furthest (aphelion) points are given for three planets below. Use this data to answer questions 5–7.

5. Which inequality represents the distances \(d\) from the sun to Neptune?

   A. \(d \leq 4444.5\)
   B. \(d \leq 4545.7\)
   C. \(4444.5 \leq d \leq 4545.7\)
   D. \(d = 4444.5\) OR \(d \geq 4545.7\)

   A NASA probe is traveling between Uranus and Neptune. It is currently between their orbits. Which inequality shows the possible distance \(p\) from the probe to the Sun?

   F. \(1542.1 < p < 1703.2\)
   G. \(2741.3 < p < 4545.7\)
   H. \(3003.6 < p < 4444.5\)
   J. \(7185.8 < p < 7549.3\)

   At what distances \(o\) do the orbits of Neptune and Pluto overlap?

   A. \(4435.0 \leq o \leq 4444.5\)
   B. \(4435.0 \leq o \leq 4545.7\)
   C. \(4444.5 \leq o \leq 7304.3\)
   D. \(4545.7 \leq o \leq 7304.3\)
Name: Rebecca
Chapter 3 Test: Solving Inequalities

Write the inequality

15) Today's temperature will be above 55°F, and not as high as 40°F.
   \[ 55 < x < 40 \]

16) Mary has been saving her money for months. She now has between $210 and $280, inclusive.
   \[ 210 \leq x \leq 280 \]

Solve the compound inequality and graph

17) \[ g - 8 > -1 \text{ or } 6 - g \geq 2 \]
   \[ g > 7 \text{ or } g \leq 4 \]

18) \[ u + 8 \geq 1 \text{ and } u - 3 < 3 \]
   \[ -7 \leq u < 6 \]

Write, Solve, and Graph

19) Tammy wants to run at least 10 miles per week. So far this week she ran 4.5 miles. Write, solve, and graph an inequality to determine how many more miles Tammy must run this week to reach her goal.
   \[ 4.5 + m \geq 10 \]
   \[ m \leq 5.5 \]
**Student Name:** Rebecca  

**Solving Compound Inequalities: Rubric**

<table>
<thead>
<tr>
<th>A.A.24</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing the linear compound inequality</td>
<td>The student correctly interprets the verbal sentence and writes the proper <strong>inequality</strong> to represent the information.</td>
<td>The student writes the <strong>inequality</strong> with signs facing the correct way. However, they incorrectly write whether it is inclusive statement or not.</td>
<td>The student makes <strong>one</strong> of the following mistakes: an algebraic mistake when <strong>solving the inequality</strong>, or does not use the correct <strong>inequality</strong> symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line.</td>
<td>The student makes <strong>two</strong> of the following mistakes: an algebraic mistake when <strong>solving the inequality</strong>, or does not use the correct <strong>inequality</strong> symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line.</td>
<td>The student makes <strong>three</strong> of the following mistakes: an algebraic mistake when <strong>solving the inequality</strong>, or does not use the correct <strong>inequality</strong> symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line.</td>
</tr>
</tbody>
</table>

**Solving and graphing the linear compound inequality**

*Worksheet:* (Weight: .25)  
*Example:* Question 10 p44*  

*Test:* (Weight: .50)  

The student correctly solves the linear compound inequality and graphs the inequality correctly on the number line.  

| The student makes **one** of the following mistakes: an algebraic mistake when **solving the inequality**, or does not use the correct **inequality** symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line. | The student makes **two** of the following mistakes: an algebraic mistake when **solving the inequality**, or does not use the correct **inequality** symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line. | The student makes **three** of the following mistakes: an algebraic mistake when **solving the inequality**, or does not use the correct **inequality** symbol, or incorrectly draws the type of circle, or incorrectly draws the direction of the line. | The student does not answer this question correctly at all. |

**Total Worksheet Score:** 14/18

**Comments:** Good job Rebecca! It’s clear that you understood the basic concepts of this assignment. However, you made many small mistakes. In the future, take your time and look over your work before handing it in.
LESSON 3-6
Practice B
Solving Compound Inequalities

Write the compound inequality shown by each graph.

1. \(-6 < x < 4\)
2. \(-6 > x \text{ OR } x < 3\) \(x < -3 \text{ or } x > 3\)
3. \(-18 < x < -14\)
4. \(-5 \leq x < 20\)

Solve each compound inequality and graph the solutions.

5. \(-15 < x < 8 \text{ and } x < -4\)
6. \(12 < 4n < 28\)

7. \(-2 \leq 3b + 7 \leq 13\)
8. \(x - 3 < -3 \text{ OR } x = 9 \geq 3\)

9. \(\frac{9k}{5} < -20 \text{ OR } 2k \geq 8\)
10. \(2s + 3 \leq 7 \text{ OR } 3s + 5 \geq 26\)

Write a compound inequality for each problem. Graph the solutions.

11. The human ear can distinguish sounds between 20 Hz and 20,000 Hz, inclusive.
12. For a man to box as a welterweight, he must weigh more than 140 lbs, but at most 147 lbs.
Lesson 3-6 Solving Compound Inequalities

Write and solve an inequality for each situation.

1. The Mexican Tetra is a tropical fish that requires a water temperature between 68 and 77 degrees Fahrenheit, inclusive. An aquarium is heated 8 degrees so that a Tetra can live in it. What temperatures could the water have been before the heating?

\[
\frac{68}{8} \leq x + 8 \leq 77 - 8
\]

\[
60 \leq x \leq 69
\]

\[
74 \leq x \leq 85 \text{ between 74 and 85°F}
\]

2. Nerissa’s car can travel between 350 and 410 miles on a full tank of gas. She filled her gas tank and drove 45 miles. How many more miles can she drive without running out of gas?

\[
350 \leq x + 45 \leq 410
\]

\[
305 \leq x \leq 365
\]

3. A local company is hiring trainees with less than 1 year of experience and managers with 5 or more years of experience. Graph the solutions.

\[
x > 1 \text{ OR } x < 1
\]

4. Marty’s allowance is doubled and is now between $10 and $15, inclusive. What amounts could his allowance been before the increase? Graph the solutions.

\[
10 \leq 2x \leq 15
\]

\[
5 \leq x \leq 7.5
\]

5. The elliptical orbits of planets bring them closer to and farther from the Sun at different times. The closest (perihelion) and furthest (aphelion) points are given for three planets below. Use this data to answer questions 5–7.

<table>
<thead>
<tr>
<th>Planet</th>
<th>Perihelion (in 10^6 km)</th>
<th>Aphelion (in 10^6 km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uranus</td>
<td>2741.3</td>
<td>3003.6</td>
</tr>
<tr>
<td>Neptune</td>
<td>4444.5</td>
<td>4545.7</td>
</tr>
<tr>
<td>Pluto</td>
<td>4435.0</td>
<td>7304.3</td>
</tr>
</tbody>
</table>

6. Which inequality represents the distances d from the Sun to Neptune?

- A) \( d \leq 4444.5 \)
- B) \( d = 4545.7 \)
- C) \( 4444.5 \leq d \leq 4545.7 \)
- D) \( d = 4444.5 \text{ OR } d \geq 4545.7 \)

7. A NASA probe is traveling between Uranus and Neptune. It is currently between their orbits. Which inequality shows the possible distance p from the probe to the Sun?

- E) \( 1542.1 < p < 1703.2 \)
- F) \( 2741.3 < p < 4545.7 \)
- G) \( 1000.0 < p < 2741.3 \)
- H) \( 2741.3 < p \leq 4545.7 \)

8. At what distances do the orbits of Neptune and Pluto overlap?

- A) \( 4435.0 \leq p \leq 4444.5 \)
- B) \( 4435.0 \leq p = 4545.7 \)
- C) \( 4444.5 \leq p \leq 7304.3 \)
- D) \( 4545.7 \leq p \leq 7304.3 \)
Write the inequality

15) Today's temperature will be above 55°F, and not as high as 60°F.
   \[ 55 < t < 60 \]

16) Mary has been saving her money for months. She now has between $210 and $280, inclusive.
   \[ 210 \leq m \leq 280 \]

Solve the compound inequality and graph

17) \[ g - 8 > -1 \text{ or } -g \geq 2 \]
   \[ g > 7 \text{ or } g \leq -2 \]
   ![Graph of inequality 17]

18) \[ x + 8 \geq 1 \text{ and } x - 3 < 3 \]
   \[ x \geq -7 \text{ and } x < 6 \]
   ![Graph of inequality 18]

Write, Solve, and Graph

19) Tammy wants to run at least 10 miles per week. So far this week she ran 4.5 miles. Write, solve, and graph an inequality to determine how many more miles Tammy must run this week to reach her goal.
   \[ 10 \leq x + 4.5 \]
   ![Graph of inequality 19]
<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Writing the</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>linear</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>compound</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>inequality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Worksheet:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Weight: .25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Example:</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p49*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Weight: .50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Solving and</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>graphing the</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>linear</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>compound</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>inequality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Worksheet:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Weight: .25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Example:</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p44*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Weight: 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Worksheet Score: 9/18**

**Comments:** Patrick great job on graphing the compound inequalities! However, you made many mistakes when writing compound inequalities to represent the word problems. The word inclusive tells you to use a greater/less than or equal to sign.
**Practice B**

**3-6 Solving Compound Inequalities**

Write the compound inequality shown by each graph.

1. \[-6 \leq x \leq -3\]
2. \[-5 \leq x \leq -2\]
3. \[-15 \leq x \leq -13\]
4. \[-10 \leq x \leq -8\]

Solve each compound inequality and graph the solutions.

5. \[-15 < x < -4\]
6. \[12 \leq 4n < 28\]
7. \[-2 < 3b + 7 \leq 13\]
8. \[x - 3 < -3 OR x - 3 \geq 3\]
9. \[5k \leq -20 OR 2k \geq 8\]
10. \[2s + 3 \leq 7 OR 3s + 5 > 26\]

Write a compound inequality for each problem. Graph the solutions.

11. The human ear can distinguish sounds between 20 Hz and 20,000 Hz, inclusive.

12. For a man to box as a welterweight, he must weigh more than 140 lbs, but at most 147 lbs.
LESSON 3-6

Problem Solving

Solving Compound Inequalities

Write and solve an inequality for each situation.

1. The Mexican Tetra is a tropical fish that requires a water temperature between 68 and 77 degrees Fahrenheit, inclusive. An aquarium is heated 8 degrees so that a Tetra can live in it. What temperatures could the water have been before the heating?

2. Nerissa’s car can travel between 380 and 410 miles on a full tank of gas. She filled her gas tank and drove 45 miles. How many more miles can she drive without running out of gas?

3. A local company is hiring trainees with less than 1 year of experience and managers with 5 or more years of experience. Graph the solutions.

4. Marty’s allowance is doubled and is now between $10 and $15, inclusive. What amounts could his allowance have been before the increase? Graph the solutions.

The elliptical orbits of planets bring them closer to and farther from the Sun at different times. The closest (perihelion) and furthest (aphelion) points are given for three planets below. Use this data to answer questions 5–7.

<table>
<thead>
<tr>
<th>Planet</th>
<th>Perihelion (in 10^6 km)</th>
<th>Aphelion (in 10^6 km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uranus</td>
<td>2741.3</td>
<td>3003.6</td>
</tr>
<tr>
<td>Neptune</td>
<td>4444.5</td>
<td>4545.7</td>
</tr>
<tr>
<td>Pluto</td>
<td>4435.0</td>
<td>7304.3</td>
</tr>
</tbody>
</table>

5. Which inequality represents the distances d from the Sun to Neptune?

A. \(d \leq 4444.5\)
B. \(d = 4545.7\)
C. \(4444.5 \leq d \leq 4545.7\)
D. \(d = 4444.5\) OR \(d \geq 4545.7\)

6. A NASA probe is traveling between Uranus and Neptune. It is currently between their orbits. Which inequality shows the possible distance \(p\) from the probe to the Sun?

F. \(1542.1 < p < 1703.2\)
G. \(2741.3 < p < 4545.7\)
H. \(3003.6 < p < 4444.5\)
J. \(7185.8 < p < 7549.3\)

7. At what distances \(o\) do the orbits of Neptune and Pluto overlap?

A. \(4435.0 \leq o \leq 4444.5\)
B. \(4435.0 \leq o \leq 4545.7\)
C. \(4444.5 \leq o \leq 7304.3\)
D. \(4545.7 \leq o \leq 7304.3\)
Write the inequality

15) Today’s temperature will be above $55^\circ F$, and not as high as $40^\circ F$.

16) Mary has been saving her money for months. She now has between $210 and $280, inclusive.

Solve the compound inequality and graph

17) $g - 8 > -1$ or $6 - g \geq 2$

18) $u + 8 \geq 1$ and $u - 3 < 3$

Write, Solve, and Graph

19) Tammy wants to run at least 10 miles per week. So far this week she ran 4.5 miles. Write, solve, and graph an inequality to determine how many more miles Tammy must run this week to reach her goal.