This unit expands on what students learned about patterns in Kindergarten. Students will learn how to describe, reproduce, extend, create, and translate patterns from one form to another. Students will also be introduced to algebraic thinking and the idea that equality is a balance and inequality is an imbalance. They will explore the meaning of the equal sign and learn to record equalities using the equal sign. This unit will take place in late fall (October-November) because it is a topic that students are already familiar with and provides meaningful opportunities for expansion.

We will be covering the following NB curriculum outcomes:

GCO: Use patterns to describe the world and solve problems.
SCO:
- PR1: Demonstrate an understanding of repeating patterns (two to four elements) by describing, reproducing, extending, and creating patterns using manipulatives, diagrams, sounds and actions.
- PR2: Translate repeating patterns from one representation to another.

GCO: Represent algebraic expressions in multiple ways.
SCO:
- PR3: Describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20).
- PR4: Record equalities, using the equal symbol.

By the end of the unit, students should be able to:

- Identify patterns and non-patterns
- Reproduce patterns
- Identify and create core patterns
- Identify and describe patterns in their own lives
- Extend patterns
- Create patterns using diagrams, manipulatives, sounds, and actions
- Translate patterns into different forms
- Describe equality as a balance
- Describe inequality as an imbalance
- Use the equal symbol correctly
References:


Description
This is an introductory lesson to a unit on patterns. It is a review of what students learned in Kindergarten about patterns and an introduction to what we will be learning about in Grade 1. Students will be reminded of what a pattern is and then asked to identify and describe various types of patterns. In small groups, students will identify pattern errors.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
- Analyze how both repeating and growing patterns are generated.

NB Math Curriculum – Grade 1
Strand: Patterns & Relations (PR)
GCO: Use patterns to describe the world and solve problems.
SCO:
- PR1: Demonstrate an understanding of repeating patterns (two to four elements) by: describing, reproducing, extending, creating patterns using manipulatives, diagrams, sounds and actions.

Materials
- Pattern Fish by Trudy Harris
- Pattern blocks
- Connecting cubes
- Teddy bear manipulatives
- Number manipulatives
- Small whiteboards
- Whiteboard markers
- SMART Board Lesson “PR1”, pages 2-4
- YouTube video “The Patterns Practice Song”: https://www.youtube.com/watch?v=MBjjxSx45-Q
- Exit Slip: “Is it a pattern?” (see attached)
- Assessment checklist

Engagement (5 minutes)
Engaging Question: What is a pattern?
The teacher will read Pattern Fish by Trudy Harris, pausing frequently to discuss patterns and allowing students to point out examples of patterns that they can see.
Explanation (5 minutes)
Referring back to the story, the teacher leads a discussion about what patterns are. Shows an example of a pattern using connecting cubes and then an example of a non-pattern.

Exploration (20 minutes)
There are four stations around the room, each containing different examples (pattern blocks, connecting cubes, teddy bear manipulatives, and number pattern sheets) of patterns and non-patterns. Students are broken into four small groups and each group is given a small whiteboard and a whiteboard marker. The groups circulate around the room spending five minutes at each station, determining which examples are patterns and which ones are not. The teacher is at the connecting cubes station completing the first column of the assessment checklist.

Elaboration (10 minutes)
Students return to the meeting area to discuss the activity and complete a related SMART Board activity (pages 2-4). The teacher plays a video (“The Patterns Practice Song”) before students go to their assigned seats.

Evaluation (10 minutes)
Individually, students complete the “Is it a pattern?” exit slip. From this information the teacher determines whether students are ready to move on to Lesson 2 tomorrow or need to continue reviewing what patterns are.

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the engagement section and given a turn during the SMART Board activity.
- The information recorded from the checklist and exit slip will help the teacher determine how to form balanced groups for upcoming lessons and whether enriched or modified activities are needed.
### Resources for Lesson 1

**Pattern Fish** by Trudy Harris

![Pattern Fish](image)

**Pattern Blocks**

![Pattern Blocks](image)

**Connecting Cubes**

![Connecting Cubes](image)

**Teddy Bear Manipulatives**

![Teddy Bear Manipulatives](image)

**SMART Board Lesson page 2:**

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Is it a pattern?</th>
</tr>
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<tbody>
<tr>
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**SMART Board Lesson page 3:**

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**SMART Board Lesson page 4:**

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</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td><img src="image" alt="Yes Pattern" /></td>
</tr>
</tbody>
</table>

**Number Manipulatives:**

![Number Manipulatives](image)
Is it a pattern?

Circle Yes or No

1) 
7 8 9 7 8 9 7 8 9 7 8 9 7 8 9
Yes  No

2) □ □ □ □ □ □ □ □ □
Yes  No

3) 
5 6 5 6 5 7 5 6 5 6
Yes  No

4) △ △ △ △ △ △
Yes  No

Name: ____________________________
Description
In this lesson, students are introduced to the concept of core patterns. They are also given time to extend core patterns in a group setting.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
- Analyze how both repeating and growing patterns are generated.

NB Math Curriculum – Grade 1
Strand: Patterns & Relations (PR)
GCO: Use patterns to describe the world and solve problems.
SCO:
- PR1: Demonstrate an understanding of repeating patterns (two to four elements) by: describing, reproducing, extending, creating patterns using manipulatives, diagrams, sounds and actions.

Materials
- YouTube video “The Patterns Practice Song”: https://www.youtube.com/watch?v=MBjjxSx45-Q
- Pattern blocks
- Connecting cubes
- Teddy bear manipulatives
- Number manipulatives
- Small whiteboards
- Whiteboard markers
- SMART Board Lesson “PR1”, pages 5-6
- Exit slip: “Colour the Core” (see attached)
- Assessment checklist

Engagement (5 minutes)
Engaging Question: What is a core pattern?
The teacher plays “The Patterns Practice Song” that students watched in Lesson 1, pausing frequently to ask students to identify the part of the pattern that repeats.

Explanation (5 minutes)
The teacher explains what a core pattern is and demonstrates this concept using connecting cubes and drawing an example using shapes on the SMART Board.
Exploration (20 minutes)
There are four stations around the room, each containing different examples of a core pattern using the same manipulatives as in Lesson 1 (pattern blocks, connecting cubes, teddy bears, and number sheets). Students are broken into small groups and each group is given a small whiteboard and a whiteboard marker. The groups circulate around the room, spending about five minutes at each station, drawing the core pattern of each example. The teacher is at the teddy bear station completing the corresponding column of the assessment checklist.

Elaboration (10 minutes)
Students return to the meeting area to discuss the activity and complete a SMART Board lesson (p. 5-6) wherein the core of a pattern is presented and students have to extend the pattern three more times.

Evaluation (10 minutes)
Individually, students complete the “Colour the Core” exit slip. From this information the teacher determines whether students are ready to move on to Lesson 2 tomorrow or need to continue reviewing what patterns are.

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the engagement section and given a turn during the SMART Board activity.
- Enrichment: students who understand the concept of a core pattern could be asked to create and extend their own core pattern during the exploration section and on the exit slip.
- Students who do not yet understand what a core pattern is should be given additional time to practice, using the SMART Board, manipulatives, and diagrams.
Resources for Lesson 2

**Number Manipulatives**

![Number Manipulatives Image]

**Pattern Blocks**

![Pattern Blocks Image]

**Connecting Cubes**

![Connecting Cubes Image]

**Teddy Bear Manipulatives**

![Teddy Bear Manipulatives Image]

SMART Board Lesson page 5:

**Extend the Pattern**

![Pattern Blocks Image]

SMART Board Lesson page 6:

**Extend the Pattern**

![Pattern Blocks Image]
Name: ___________________

Colour the Core!

1) □□□□□□□□□□□

2) □□□□□□□□□□□

3) □□□□□□□□□□□

4) □□□□□□□□□□□
Description
In this lesson, students are asked to identify the missing elements of various patterns, introduced to patterns in the real world, and given examples of sound and action patterns.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
- Analyze how both repeating and growing patterns are generated.

NB Math Curriculum – Grade 1
Strand: Patterns & Relations (PR)
GCO: Use patterns to describe the world and solve problems.
SCO:
- PR1: Demonstrate an understanding of repeating patterns (two to four elements) by: describing, reproducing, extending, creating patterns using manipulatives, diagrams, sounds and actions.

Materials
- SMART Board Lesson “PR1”, pages 7-8
- SMART Board Lesson “PR1”, pages 9-10
- “Days of the week” cards – prepared; multiple sets (see attached)
- “Seasons” cards – prepared; multiple sets (see attached)
- “Story” cards – prepared; multiple sets (see attached)
- “Olympics” cards – prepared; multiple sets (see attached)
- Assessment checklist

Engagement (10 minutes)
Engaging Question: How are patterns part of our lives?
As a class, students complete the “Missing Elements” SMART Board lesson (p. 7-8) that includes patterns in our daily lives, such as the days of the week and months of the year.

Explanation (5 minutes)
The teacher leads a discussion about these patterns and asks students to come up with other examples of patterns in the real world.
Exploration (20 minutes)
There are four stations around the room, each containing different examples of patterns found in the real world (days of the week, months of year, stories, and Olympics). Students are broken into four small groups and asked to spend five minutes at each station arranging the cards in the right order to form a pattern. The teacher is at the days of the week station completing the corresponding column of the assessment checklist.

Elaboration (10 minutes)
Students return to the meeting area to discuss the activity and go over the patterns found at the four stations. Sound and action patterns are also introduced using a SMART Board activity (p. 9-10).

Evaluation (5 minutes)
Students are asked to self-assess their behaviour and progress by holding up one to three fingers (one = not yet, two = getting there, three = got it). The teacher asks the following questions: Did I work with my group to find the answers? Did everybody get a turn? Do I understand what a pattern is?

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the engagement and elaboration SMART Board activities.
- Enrichment: students who understand the examples provided during the exploration section should be asked to come up with other examples of patterns in the real world and draw diagrams to represent them.
- Students who do not yet understand what a core pattern is should be given additional time to practice, using the SMART Board, manipulatives, and diagrams.
<table>
<thead>
<tr>
<th>Resources for Lesson 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SMART Board Lesson page 7:</strong></td>
</tr>
<tr>
<td>Fill in the Missing Pieces</td>
</tr>
<tr>
<td><strong>SMART Board Lesson page 8:</strong></td>
</tr>
<tr>
<td>Fill in the Missing Pieces</td>
</tr>
<tr>
<td>DEFD F EF DEF</td>
</tr>
<tr>
<td><strong>SMART Board Lesson page 9:</strong></td>
</tr>
<tr>
<td><strong>Sound Patterns</strong></td>
</tr>
<tr>
<td><strong>SMART Board Lesson page 10:</strong></td>
</tr>
<tr>
<td><strong>Action Patterns</strong></td>
</tr>
<tr>
<td>clap snap clap snap clap snap clap snap</td>
</tr>
<tr>
<td>left left right left right left left right</td>
</tr>
<tr>
<td>clap snap tap clap snap tap clap snap tap</td>
</tr>
<tr>
<td>Sunday</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Tuesday</td>
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<tr>
<td>Thursday</td>
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<tr>
<td>Saturday</td>
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<tr>
<td>Fall</td>
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<td>-------------------</td>
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<tr>
<td><strong>Summer</strong></td>
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<td><strong>Spring</strong></td>
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<tr>
<td><strong>Winter</strong></td>
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<tr>
<td>Beginning</td>
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<tr>
<td>-----------</td>
</tr>
<tr>
<td>Middle</td>
</tr>
<tr>
<td>End</td>
</tr>
<tr>
<td>Winter Olympics</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td><img src="image1" alt="Olympic Rings" /></td>
</tr>
<tr>
<td>Summer Olympics</td>
</tr>
<tr>
<td><img src="image3" alt="Olympic Rings" /></td>
</tr>
<tr>
<td>No Olympics</td>
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<tr>
<td><img src="image5" alt="Olympic Rings" /></td>
</tr>
<tr>
<td>No Olympics</td>
</tr>
<tr>
<td><img src="image7" alt="Olympic Rings" /></td>
</tr>
</tbody>
</table>
Description
In this lesson, students continue to explore core patterns and begin to experiment with making their own patterns using manipulatives and diagrams. Students will be allowed to work together but must demonstrate their own learning at the end of the lesson.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
- Analyze how both repeating and growing patterns are generated.

NB Math Curriculum – Grade 1
Strand: Patterns & Relations (PR)
GCO: Use patterns to describe the world and solve problems.
SCO:
- PR1: Demonstrate an understanding of repeating patterns (two to four elements) by: describing, reproducing, extending, creating patterns using manipulatives, diagrams, sounds and actions.

Materials
- YouTube video “BrainPOP Patterns”
  https://www.youtube.com/watch?v=-00zNt9RzoQ
- Connecting cubes
- Money manipulatives
- Pattern blocks
- “Creating Patterns!” worksheet (see attached)
- Assessment checklist

Engagement (5 minutes)
Engaging Question: How do we create patterns?
The teacher leads a brief discussion about core patterns and reviews what we have learned about patterns so far.

Explanation (5 minutes)
The teacher plays a BrainPOP video about patterns, which provides an overview of patterns: what they are, where they are found, and what makes a pattern a pattern.
Exploration (20 minutes)
The students will be broken into small groups and will spend five minutes at each of four stations creating patterns of their own using connecting cubes, money manipulatives, pattern blocks, and then drawing patterns on a worksheet. The teacher will be circulating through the stations making sure that students understand how to create a pattern of their own.

Elaboration (10 minutes)
Students will return to the meeting area and share the patterns that they drew with the class. The teacher will briefly discuss how you can name a core pattern (i.e. AB, ABC, ABBA, etc.), which will be explored in more detail in later lessons.

Evaluation (10 minutes)
Students will go to their assigned seats and create a pattern using any type of manipulative. The teacher will complete the corresponding column on the assessment checklist, making note of students who are able to correctly name their pattern in addition to being able to create a pattern.

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the discussion portion of the lesson.
- Enrichment: students who understand how to create a pattern will be asked to name their pattern using the letter format.
- Students who do not yet understand how to create a pattern will be allowed to work with a partner during the evaluation portion of the lesson.
Resources for Lesson 4

<table>
<thead>
<tr>
<th>Money Manipulatives</th>
<th>Pattern Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Money Manipulatives" /></td>
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<table>
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<tr>
<th>Connecting Cubes</th>
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<tbody>
<tr>
<td><img src="image3" alt="Connecting Cubes" /></td>
</tr>
</tbody>
</table>
Name: ______________________

Creating Patterns!

1)

2)

3)

4)

5)
Teacher: Kelsey Pohle  
Subject: Grade 1 Mathematics – Patterns & Relations Unit  
Time: 50 minutes  
Lesson 5

Description
This lesson will review core patterns and many of the other concepts covered thus far. Students will further explore sound and action patterns and will create patterns in many different forms.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
- Analyze how both repeating and growing patterns are generated.

NB Math Curriculum – Grade 1  
Strand: Patterns & Relations (PR)  
GCO: Use patterns to describe the world and solve problems.
SCO:
- PR1: Demonstrate an understanding of repeating patterns (two to four elements) by: describing, reproducing, extending, creating patterns using manipulatives, diagrams, sounds and actions.

Materials
- SMART Board Lesson “PR1”, pages 11-12  
- Connecting cubes  
- “Creating Pattern!” worksheet  
- Various instruments  
- Exit slip: “Draw 3 Patterns” (see attached)  
- Assessment checklist

Engagement (10 minutes)
Engaging Question: What do we know about patterns?
Students complete a SMART Board activity that reviews what they have learned about patterns, providing examples using a variety of materials, sounds, and actions.

Explanation (5 minutes)
Students further explore sound and action patterns in two example of each, as directed by the teacher. This gives students an opportunity to get up and move.

Exploration (20 minutes)
There are four stations around the room, each giving students an opportunity to create their own patterns (using manipulatives, diagrams, instruments, and actions). Students are broken into four small groups and spend five minutes at each station creating patterns with their classmates. The teacher is at the “action” station completing the corresponding column of the assessment checklist.
Elaboration (5 minutes)
Students will return to the meeting area the teacher will provide a brief demonstration of how the same pattern (i.e. ABC) can be translated into different forms. This will be explored in more depth later on in the unit.

Evaluation
Individually, students complete the “Draw 3 Patterns” exit slip. From this information the teacher determines whether students are ready to move on to translating patterns from one form to another or whether more time is needed for students to grasp how to create simple patterns on their own.

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the SMART Board lesson.
- Enrichment: students who understand how to create a pattern will be asked to name their pattern using the letter format and translate a pattern from one form to the other on their exit slips.
- Students who do not yet understand how to create a pattern will be allowed to work with a partner during the evaluation portion of the lesson.
### Resources for Lesson 5

<table>
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<tr>
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<th>Classroom Instruments</th>
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<td><img src="image2.png" alt="Classroom Instruments" /></td>
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#### SMART Board Lesson page 11:

**Review**

Extend:

```
   □ △ □ □
   □ □ □ □
   2 3 2
```

#### SMART Board Lesson page 12:

Create your own pattern!
Draw 3 Patterns

1)

2)

3)

Name: ____________________
Teacher: Kayla Maloney  
Subject: Grade 1 Mathematics – Patterns & Relations Unit  
Time: 50 minutes  
Lesson 6

Description
As a warm up we will sing a song that involves repetitive patterns (Eg. Hokey Pokey). Following the warm up there will be a whole class discussion. We will discuss patterns in our daily lives, where to find them, and specific examples. Students will be introduced to the different types of patterns: rhythmic/sound; action; colour; shape, etc. Following whole class instruction, in small groups we will practice making patterns with different manipulatives (coloured blocks, cubes, classroom items, etc.) To end the lesson the small groups will complete a “Show and Share” activity. Students will compare the patterns they have created and we will discuss the similarities and differences as a group.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
- Analyze how both repeating and growing patterns are generated.

NB Math Curriculum – Grade 1  
Strand: Patterns & Relations (PR)
GCO: Use patterns to describe the world and solve problems.
SCO:
- PR2: Translate repeating patterns from one representation to another.

Materials
- Hokey Pokey music
- Connecting cubes
- Pattern blocks
- SMART Board lesson
- Assessment checklist

Engagement (10 minutes)
Students will sing “The Hokey Pokey” as a whole class. After the song the teacher will ask questions about the song (Eg. Did you notice any patterns? Was it repetitive? Did you notice patterns in the music and movement?) The students will sing it again, this time knowing the song involves patterns. Following the song the teacher will ask the students to identify patterns in their daily lives. The students can discuss or show the class the types of patterns they experience in their lives.
Explanation (10 minutes)
Following the warm up the teacher will move on to whole class instruction. The teacher will introduce the different types of patterns to the class and provide examples for each. The teacher will explain that “The Hokey Pokey” was an example of a pattern using rhythm and sound. For action patterns, the teacher will clap out a rhythm and have the class repeat the same pattern back. For colour and shape patterns the teacher will bring up images on the SMARTBoard that represent these patterns. For example, two red shapes followed by a blue shape. The teacher will then provide examples of patterns in daily life the students may not have considered.

Exploration (20 minutes)
The students will complete an explore activity with various manipulatives. The teacher will show the students an example using coloured cubes. Following the explore activity explanation the teacher will place the students into groups of 2-3. Within their groups the students will be asked to create a pattern using a manipulative of their choice. The teacher will explain to the students that they may create a pattern with shapes or colours (depending on the manipulatives they chose). Once the students have created their patterns they will complete the “Show and Share” portion of the activity. They will show and explain their pattern to the class. Each pair of students will have the opportunity to show their pattern to the class. The teacher will then summarize and review everything that was learned throughout this activity.

Elaboration & Evaluation (10 minutes)
During the warm up and explore activity the teacher will circulate through the classroom and observe the students. The teacher will explain that if any students need help during the activity they may raise their hand and the teacher will come over. The teacher will also emphasize to students that their partner is also there to help them, the rest of their classmates as well. (They may help each other if needed). As an Exit Question to check for understanding the teacher will ask the students: "Mary has six green triangles and three orange squares." Show students the pieces on the SMARTBoard. Then ask, "Can she make two different patterns?" Have students to draw two possible patterns and record in the assessment checklist.

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the SMART Board lesson.
- Enrichment: students who understand how to create a pattern will be asked to name their pattern using the letter format and translate a pattern from one form to the other on their exit question.
Resources for Lesson 6

<table>
<thead>
<tr>
<th>SMART Board Lesson:</th>
<th>Pattern Blocks</th>
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</thead>
<tbody>
<tr>
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<td><img src="image" alt="Pattern Blocks" /></td>
</tr>
<tr>
<td>Connecting Cubes</td>
<td></td>
</tr>
</tbody>
</table>
Teacher: Kayla Maloney
Subject: Grade 1 Mathematics – Patterns & Relations Unit
Time: 50 minutes
Lesson 7

Description
The primary focus of this lesson is to review patterns and translating repeating patterns. To begin the lesson we will listen to the “AAB” pattern song on YouTube. Following the song we will complete a warm up activity involving rhythmic clapping. The rest of the class time will be spent on two hands on activities— both of which involve pattern making and different representations. The second activity make take more than one class to complete.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
- Analyze how both repeating and growing patterns are generated.

NB Math Curriculum – Grade 1
Strand: Patterns & Relations (PR)
GCO: Use patterns to describe the world and solve problems.
SCO:
- PR2: Translate repeating patterns from one representation to another.

Materials
- AAB Pattern song
https://www.youtube.com/watch?v=hisZ9PLKWbM
- Long strips of paper
- Markers, Crayons, Pencil Crayons
- Pattern Block Template
- “Fruit Loop” worksheet
- Fruit Loops
- Glue
- Assessment checklist

Engagement (10 minutes)
The teacher will play the pattern song a few times so the students pick up on the patterns and sing along. Following the YouTube video the students will begin the review with a clapping warm up. As a class we will sing “Going on a Treasure Hunt” and the students will practice rhythmic patterning by clapping while they sing the song. This should be treated as a warm up and mini review of the things learned in the previous class.
Explanation (10 minutes)
The teacher will review the different types of patterns learned in the previous class. When each type of pattern is brought up the teacher will ask the students to provide examples from the previous class, or anything they may have experienced at home. This will allow the teacher to check for understanding before moving onto the explore activities for the day.

Exploration (20 minutes)
The teacher will provide a Pattern Block Template to students and explain the activity to follow. The students will be asked to create any pattern of their choice using the shapes provided. The students must use at least two different shapes and colours. Once they have traced their patterns onto the paper provided by the teacher they must label their patterns correctly in sequence. (Eg. ABABA, AABBA, AABAB, etc.) The teacher will circulate throughout the room during this activity to ensure the students are on the right track. Following this the students will move on to the final activity.

Elaboration & Evaluation (10 minutes)
This final activity will be used to check for understanding and assess the students knowledge of Patterns and Representations. The teacher will provide the students with the “Fruit Loop” activity sheet and explain. The students will be given coloured Fruit Loops and will be required to create a pattern of their choosing. They must use at least two different colours, however some students may want to use three. On the activity sheet the students will glue down their pattern created by fruit loops. Following the gluing they must label their patterns by colour, number and letter representation. Depending how long the first activity takes this second activity may need to be finished in the following class. The activity sheets will be handed in to the teacher as a means of formal assessment. The teacher will also observe the students during the lesson to ensure understanding. The teacher should ask questions as the students are working on their activities. (Eg. What pattern have you created? Why did you choose this pattern? Do you notice anyone else in the class with a similar pattern? etc.)

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the explanation section.
- Enrichment: students who understand how to create a pattern will be asked to name their pattern using the letter format and translate a pattern from one form to the other on their exit question.
- Students who are having difficulty understanding patterns will be allowed to work in pairs.
Resources for Lesson 7
Fruit Loops worksheet

I can make a pattern! Name: __________

My pattern has a letter name: __________________________
My pattern has a number name: __________________________
My pattern has a color name: __________________________

I can make a pattern! Name: __________

My pattern has a letter name: __________________________
My pattern has a number name: __________________________
My pattern has a color name: __________________________
Teacher: Kelsey Pohle
Subject: Grade 1 Mathematics – Patterns & Relations Unit
Time: 50 minutes
Lesson 8 (Summative Assessment for PR1 & PR2)

Description
This is a summative lesson that allows students to show what they know about describing, reproducing, extending, creating, and translating patterns from one form to another.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
- Analyze how both repeating and growing patterns are generated.

NB Math Curriculum – Grade 1
Strand: Patterns & Relations (PR)
GCO: Use patterns to describe the world and solve problems.
SCO:
- PR1: Demonstrate an understanding of repeating patterns (two to four elements) by: describing, reproducing, extending, creating patterns using manipulatives, diagrams, sounds and actions.
- PR2: Translate repeating patterns from one representation to another.

Materials
- YouTube video “BrainPOP Patterns”
  https://www.youtube.com/watch?v=-00zNt9RzoQ
- “Patterns Assessment” document (see attached)
- Connecting cubes
- Teddy bear manipulatives
- Pattern blocks
- Various instruments

Engagement (10 minutes)
Engaging Question: What do we know about patterns?
The teacher will play the video “BrainPOP Patterns”, which provides an overview of what patterns are and will help prepare students to complete their assessment.

Explanation (5 minutes)
The teacher will lead a brief discussion about what students are expected to do during the lesson and give students an opportunity to ask any questions they might have.
Exploration/Evaluation (30 minutes)
Students will be asked to create a core pattern using three or four elements and represent it in letter form (i.e. ABC, ABB, ABBA, etc.). They will record this pattern at the top of their assessment sheet. Students will divided into four groups and will cycle through four stations wherein they will be asked to individually translate their core into four different forms, making sure the core is repeated at least three times in each representation. Students will record these different representation on the assessment sheet (the teacher will have to help students spell action and sounds words). They will give the assessment to the teacher when it is completed.

Elaboration (5 minutes)
The teacher will provide a brief overview of the unit and transition into what students will be learning about in the next class.

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the discussion portion at the beginning of the lesson.
- Enrichment: students who can easily create a core pattern and translate it into various other representations will be encouraged to create more complex patterns that contain more elements and translate them into more representations.
- Students who are struggling with patterns will be allowed to create core patterns with two elements and/or only translate them into two or three representations instead of four.
Resources for Lesson 8 (Summative Assessment for PR1 & PR2)

<table>
<thead>
<tr>
<th>Classroom Instruments</th>
<th>Pattern Blocks</th>
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<tbody>
<tr>
<td>Connecting Cubes</td>
<td>Teddy Bear Manipulatives</td>
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</table>
Name: ______________________

**Patterns Assessment**

My core pattern: ____________

I can draw my pattern:

I can make my pattern using manipulatives:

I can make my pattern using actions:

I can make my pattern using sounds:
Description
To begin this lesson, students will engage in a movement review of translating patterns. Next, students will congregate in front of the Smart board and engage in a pictorial lesson about equality and inequality using various symbols. Then, students will be introduced to the equal sign as a relation, not operation (meaning the same, not “the answer is”). Equality and inequality will also be represented using a scale. Students will use the knowledge gained from this mini-lesson to explore in groups the different pictorial representations on the Smart board and will record their answers on a group worksheet. The class as a whole will explore the same pictorial representations. Finally, students will work individually on a simple practice sheet and engage in an exit question through a teacher-student conference.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Understand patterns, relations, and functions
- Represent and analyze mathematical situations and structures using algebraic symbols
- Use mathematical models to represent and understand quantitative relationships

NB Math Curriculum – Grade 1
Strand: Patterns & Relations (PR)
GCO: Represent algebraic expressions in multiple ways.
SCO:
- PR4: Describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20).

Materials
- Smart board lesson
- Balance manipulative
- Physical manipulatives (connecting cubes, base ten blocks, etc.)
- Work sheets
- Practice sheets
- Exit question
- Assessment checklist

Engagement (10 minutes)
Students will begin by looking at a letter pattern on the Smart board. They will be asked to translate this pattern into colours and then into animals. Next, students will translate the animal pattern into animal noise pattern (ie: moo, oink, baa, moo…). The teacher can ask students to come to the front of the class and act out the animal noise pattern. This pattern will then be translated into an action pattern using clapping, jumping, snapping, and twirling. This engagement activity will have reviewed PR2.
Explanation (10 minutes)
Students will gather in front of the Smart board to begin a pictorial and representational lesson on equality and inequality as a balance and imbalance. First, the teacher will show students different symbols that are common to everyday life (circle with a line through it, no dogs sign, etc…). The teacher will ask why there is a line through some of the symbols and not others. Students will understand that the line through the symbols means “not” or “don’t.” Next, the students will be shown an equal sign and a not equal sign. They should acknowledge that the equal sign means “same” and the not equal sign means “not the same.” Finally, the teacher will use the balance manipulative to represent how equality is a balance and inequality as an imbalance by placing an equal number of connecting cubes on both sides, and then removing some to create an imbalance.

Exploration (20 minutes)
Students will get into groups of 3 and will share a worksheet between them. One student in the group will be the recorder. The teacher will put up pictorial representations on the Smart board that will show two boxes with shapes inside.

Students will work in their groups to identify whether the representations are equal/balanced or unequal/unbalanced. The representations will be shown in two boxes side by side as follows:
- 6 stars in order/6 stars scattered
- 20 counters in 10 frames/17 counters scattered
- 20 counters in 10 frames/20 stars in order
- the number 16/the number 16
- the number 6/4 and 2 more
- one less than 5/one more than 3

When the students get through all six representations, the teacher will direct a whole group review of what different groups did to find out the answers. Students will be asked to come up to the Smart board and demonstrate what their groups did. The teacher will look for proof of prior knowledge such as crossing out as they count, counting by 5’s, counting two more and two less, counting one more and one less.
Elaboration & Evaluation (10 minutes)
The teacher will show the practice sheet on the Smart board and explain it to students. The teacher will explain that if a student needs help, to raise their hand rather than following the teacher around the class and also informs students to skip a question and go to the next one if they are stuck. The teacher will hand out practice sheet and allow students to sit at tables to work on them individually and will have previously placed counters at each table to help students physically represent their practice questions if needed. The teacher will gather practice sheets when students are finished and will circle questions that need to be done again, and place check marks where students answered successfully. Students will return to their tables to fix their errors on their practice sheets. The teacher will assess student comprehension through an exit question that will be recorded in a running record.

Exit question: Have two sets of counters that are equal. Have students decide if they are equal or not equal. Have them place an equal or not equal sign between the counters.
Resources for Lesson 9

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<th>Balance Manipulatives</th>
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<th>Connecting Cubes</th>
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Description
Students will begin lesson 2 of PR3 outcome with a movement activity. The teacher will play music and allow students to move and dance around the classroom, when it is paused they will get into two groups. This will happen until the song ends and the teacher will count both groups and record the numbers on the Smart board. Students will gather in front of the Smart board and discuss whether their groups were equal or unequal. Next, students will engage in a review of the equal and not equal symbols and what they mean as relations not operations. Students will be asked to represent a picture showing equality and a picture of inequality on the Smart board. Then, students will perform an explore activity using different math models and balances. Students will record what they discovered using math models by drawing pictures of them on their work sheets. These will be shared in a group congress. Last, students will complete a practice sheet where they must recognize and represent equality and inequality. They will also complete an exit question through a teacher-student conference.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Understand patterns, relations, and functions
- Represent and analyze mathematical situations and structures using algebraic symbols
- Use mathematical models to represent and understand quantitative relationships

NB Math Curriculum – Grade 1
Strand: Patterns & Relations (PR)
GCO: Represent algebraic expressions in multiple ways.
SCO:
- PR4: Describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20).

Materials
- Smart board lesson
- Math song
  https://www.youtube.com/watch?v=gLwrQBQ5JJF
- Physical manipulatives (counters, connecting cubes, etc)
- Balance manipulatives
- Explore worksheets
- Practice sheets
- Exit question
- Assessment checklist
Engagement (10 minutes)
The teacher will get all the students to stand up and scatter around the classroom. The music will begin and the students will move or dance around the classroom. When the music is paused, get students to move into no more than two groups. The teacher will record how many students are in each group on the Smart board. Repeat this until the song is finished (no longer than 3 minutes). Get students to congregate in front of the Smart board. Based on the numbers that were recorded, ask the students whether they had many groups that were equal or unequal. Remind students that equal means the same or balanced, and unequal means not the same or unbalanced. To further engage students, the teacher could ask students to compare numbers why pointing out which in the group is bigger or smaller. (ie: 8 students in a group is smaller than 10 students in a group).

Explanation (10 minutes)
The teacher will keep students gathered in front of the Smart board to review equal and not equal symbols and their meanings. Students will be shown the equal symbol and will be asked what it means. Teacher is looking for proof that students understand that the equal sign in this context is a relation that means the same, or balanced. Students will be shown the not equal sign and will be asked what it means. Teacher is looking for proof that students understand that the not equal sign in this context is a relation that means not the same, or unbalanced. Students will be asked how to draw a picture that represents equality. There will be a picture of a balanced scale on the Smart board to facilitate this portion of the lesson. The teacher will ask a student to approach the Smart board and draw a picture that represents equality. Students will be asked how to draw a picture that represents inequality. There will be a picture of an unbalanced scale on the Smart board to facilitate this portion of the lesson. The teacher will ask a student to approach the Smart board and draw a picture that represents inequality. Encourage students to use different pictorial representations such as shapes, animals, smiley/sad faces, etc.

Exploration (20 minutes)
Students will be put into groups of 4 and will work at tables for this explore activity. There will be two or three scales and a bucket containing a math model at each table to be shared amongst group members. Students will be handed a work sheet that had three pictures of a balanced scale and three pictures of an unbalanced scale on it. They will use their math models and balances to help represent 3 equal pictures and 3 unequal pictures. These will be draw and recorded on their worksheets. When finished, students will re-group in front of the Smart board to share some of their drawings of equality and inequality.

Elaboration & Evaluation (10 minutes)
Students will remain gathered in front of the Smart board. The teacher will review what is to be done to complete the practice sheet.

Exit question: Show students two unequal sets of counters. Ask the student if the sets are equal or unequal. Then ask “How could you make them equal?” Answers from exit question will be recorded in a running record.
Resources for Lesson 10

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<tr>
<th>Balance Manipulatives</th>
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<th>Teddy Bear Manipulatives</th>
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<td><img src="image" alt="Teddy Bear Manipulatives" /></td>
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Name: ____________________
Description
The following activity will explore equalities and how equalities are represented using the equals sign. Students will have the opportunity to learn how to build and represent equalities using the manipulative of Cuisenaire Rods.

Outcomes
NCTM Standards – Algebra Pre-K-2
• Understand patterns, relations, and functions
• Represent and analyze mathematical situations and structures using algebraic symbols
• Use mathematical models to represent and understand quantitative relationships

NB Curriculum
Strand: Patterns & Relations (PR)
GCO: Represent algebraic expressions in multiple ways.
SCO:
• PR4: Record equalities using the equal symbol.

Materials
• Cuisenaire Rods
• “Humpty Dumpty” worksheet
• “Squeakquel the Equals Sign” Anchor Chart
• Assessment checklist

Engagement (5 minutes)
Engaging question: Has anyone ever heard of the word "equal" before?

Explanation (20 minutes)
The teacher introduces the equal sign by using the anchor chart: "Squeakquel the Equals Sign". The teacher then explains that the equals sign shows that things on both sides of it are the same and show examples on the white board such as 2+1=3. She then explains that the numbers on the left side of the equals side are the same as the number on the right side of the equals sign, and that they therefore equal. The teacher introduces the Cuisenaire Rods and explains how each colour represents each number. The teacher explains the “Humpty Dumpty” worksheets and how students will use the Cuisenaire Rods to build his wall of equalities and explains what an equality is.
Exploration (20 minutes)
Students will work on the Humpty Dumpty sheet, building his wall using Cuisenaire Rods. Students will be practicing how to represent an equality using manipulatives, and how equalities are recorded using the equals sign.

Elaboration & Evaluation (5 minutes)
During the activity, the teacher will circulate through the classroom, conferring with students and observing their work. The teacher will record what they see in the checklist and use the information for future lesson planning. After the activity, the teacher will re-group the class and have a whole group discussion about the activity. The teacher will ask the students what they have learned about equalities and what the equals sign means. The teacher will elaborate that the equals sign is different from an operations sign (+ or -).

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the explanation portion of the lesson.
- The information recorded on the running record checklist the teacher will determine whether more time is needed on this topic and if there are students who need additional help and/or resources.
Resources for Lesson 11

<table>
<thead>
<tr>
<th>“Squeakqual the Equal Sign” Anchor Chart</th>
<th>Cuisenaire Rods</th>
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<tr>
<td><img src="image1" alt="Anchor Chart" />.jpg</td>
<td><img src="image2" alt="Cuisenaire Rods" />.jpg</td>
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</table>
| the equals sign tells us that things on both sides are the SAME (Here’s how it works: 3+1=4) | Cuisenaire Rods | 1. white  
2. red  
3. lime green  
4. magenta  
5. yellow  
6. dark green  
7. black  
8. brown  
9. blue  
10. orange |
| “Humpty Dumpty” worksheet | |
| ![Humpty Dumpty](image3).jpg | |
| 6 Help Humpty build his wall | |
| 0+6=6  
1+5=6  
2+4=6  
3+3=6  
4+2=6  
5+1=6  
0+6=6 |
Description
Students will explore different pictorial representations of equalities and be asked to represent them in symbolic form. The activity, based on the book "Balancing Act" by Ellen Stoll Walsh, explores the fact that both sides of an equation need to be equal and balanced in order to use the "equal to" symbol.

Outcomes
NCTM Standards – Algebra Pre-K-2
- Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers.
- Use concrete, pictorial, and verbal representations to develop an understanding of invented and conventional symbolic notations.

NB Curriculum
Strand: Patterns and Relations (PR)
GCO: Represent algebraic expressions in multiple ways.
SCO:
- PR4: Record equalities using the equal symbol.

Materials
- "Balancing Act" by Ellen Stoll Walsh
- NCTM Variable Playing Cards Activity Sheets (see attached)
  - Copy back-to-back on cardstock. When complete, the back of the mouse card should have the letter m. Place in plastic bag.
- NCTM Mathematical Symbols Sheets (see attached)
  - Copy on cardstock. Place in plastic bag.
- Card Stock
- Scissors
- Glue
- Bags (to put the cards in)
- Index Cards
- Assessment checklist

Engagement (10 minutes)
Teacher reads "Balancing Act" by Ellen Stoll Walsh and leads a discussion about the story.
Explanation (10 minutes)
The teacher reviews number sentences and explain that we read and write them from left to right. The teacher explains to the students that they are going to use the pictures to create number sentences using the "equals to" sign. She reviews the story by asking students if mouse + mouse=mouse + salamander. The answer is no. Explains that things have to be the same on both sides, therefore mouse + salamander=mouse + salamander.

Exploration (20 minutes)
Students are divided into pairs and given bags of cards. Students are given time to explore the cards before they begin the activity. Students will explore the sets of cards, creating equations such as: mouse + mouse=mouse + mouse, salamander + bird=salamander + bird, etc.

Elaboration & Evaluation (10 minutes)
During the activity, the teacher circulates through the classroom and observes the pairs at work. She records observations in the assessment checklist and gives assistance to those who need it. The teacher confers with students by asking them what strategies they are using to figure out the equalities. After the activity, students pack up their cards and each student is given an index card. They are asked to draw and represent their own equality using the equals sign. Have them pass it in, and evaluate accordingly.

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the explanation portion of the lesson.
- Enrichment: students who have a good understanding of the lesson can be asked to draw more than one equality on their index card.
- Students who are having difficulty understanding equality can work with a partner during the evaluation portion of the lesson.

Lesson adapted from: http://illuminations.nctm.org/Lesson.aspx?id=3886
Resources for Lesson 12

*Balancing Act* by Ellen Stoll Walsh
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Teacher: Katie Clow  
Subject: Grade 1 Mathematics – Patterns & Relations Unit  
Time: 50 minutes  
Lesson 13

**Description**  
Students will explore equalities of the same quantity (0 to 20) by completing number sentences. Students will review what they have learned using flashcards, followed by a pair activity and then complete a worksheet independently.

**Outcomes**  
NCTM Standards – Algebra Pre-K-2  
- Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers.  
- Use concrete, pictorial, and verbal representations to develop an understanding of invented and conventional symbolic notations.

NB Curriculum  
Strand: Patterns & Relations (PR)  
GCO: Represent algebraic expressions in multiple ways.  
SCO:  
- PR4: Record equalities using the equal symbol.

**Materials**  
- Flash Cards – prepared  
- “Number Sentence” Worksheet from math-drills.com (see attached)  
- Assessment checklist

**Engagement (10 minutes)**  
Warm up activity: Present the students with flash cards that have number sentences written on them. Show them to the class and ask whether they are correct or incorrect, or, whether or not things are the same on both sides of the equal symbol. (For example: 6+4=10 would be correct).

**Explanation (10 minutes)**  
The teacher explains the next activity, which will be done in pairs. Students will be given a number between 1 and 20 and will have to come up with as many different equations as possible for that number. She explains that the last activity will require students to complete a worksheet independently, which will require them to fill in the equality number sentences.

**Exploration (20 minutes)**  
Working in pairs, students will write as many different equations as possible for a number from 1 to 20. (For example, one pair may have the number 13 and write the following: 13 = 1 + 12 13 = 2 + 11 13 = 3 + 10 and so on). When this activity is complete, students will independently work on the “Number Sentence” worksheet.
Elaboration & Evaluation (10 minutes)
Teacher observes students during the flashcards and makes a mental note to see who is answering correctly/incorrectly. Invite students to share their equations after the pair activity. Ask the whole class questions like "Can this number be represented in any other way?" Circulate the classroom and observe and confer with students. Record notes in the assessment checklist. Collect students’ individual worksheets and correct them to see who has a grasp on the concept of equalities, and who still needs practice.

Accommodations
- Students who have ADHD or difficulty paying attention should be called on during the explanation portion of the lesson.
- This lesson will help the teacher to determine which students understand who to record equalities using the equal symbol and which students will need additional help.
Equalities (A)
Find the value of each unknown.

9 + ⦃ = 11 + 20
7 + ♦ = 13 + 19

14 + □ = 18 + 17
♦ + 14 = 16 + 1

17 + 20 = 21 + ⦃
15 + 13 = 23 + ■

11 + 18 = 14 + □
23 + 7 = 12 + ♥

18 + 19 = ★ + 23
19 + 23 = 20 + □

11 + ◇ = 11 + 12
17 + □ = 24 + 9

6 + Δ = 8 + 2
19 + 11 = ◇ + 10

○ + 2 = 20 + 4
17 + ★ = 14 + 11

□ + 16 = 23 + 10
2 + 16 = 7 + 8

5 + ♠ = 8 + 22
12 + 20 = 7 + □
Equalities (A) Answers
Find the value of each unknown.

9 + □ = 11 + 20
□ = 22

7 + ♠ = 13 + 19
♠ = 25

14 + □ = 18 + 17
□ = 21

♠ + 14 = 16 + 1
♠ = 3

17 + 20 = 21 + □
□ = 16

15 + 13 = 23 + ■
■ = 5

11 + 18 = 14 + □
□ = 15

23 + 7 = 12 + ♥
♥ = 18

18 + 19 = ♠ + 23
♠ = 14

19 + 23 = 20 + □
□ = 22

11 + □ = 11 + 12
□ = 12

17 + 9 = 24 + 9
□ = 16

6 + Δ = 8 + 2
Δ = 4

19 + 11 = □ + 10
□ = 20

o + 2 = 20 + 4
o = 22

17 + ♠ = 14 + 11
♠ = 8

□ + 16 = 23 + 10
□ = 17

2 + 16 = 7 + x
x = 11

5 + ♠ = 8 + 22
♠ = 25

12 + 20 = 7 + □
□ = 25

Math-Drills.Com
## Sample Assessment Checklist

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