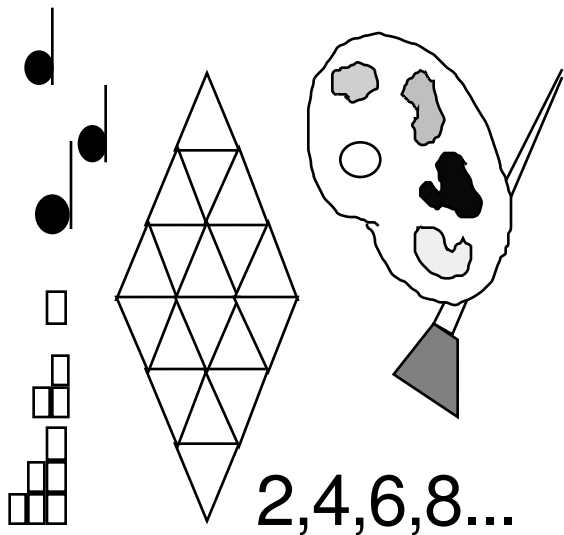


Pattern Play in the Arts

Patterning Algebra & Numeration



Including:

Let's Explore Patterning in the Arts
A Mathematical Artist~The Culminating Task
Musical Patterns and Note Measurement
Patterns in Movement and Dance
Visual Art- Name Logo
Patterns in Numeration- Hundreds Chart
Tell About Your Pattern- Guess My Rule
Missing Parts~ Relationships in Patterns
Museum of Patterning~Culminating Task
An Artistic Presentation- Celebrating

An Integrated Unit for Grade 2

Written by:

Katherine Grennell, Michele McGrath, Tammy Clune (Project Manager)

Length of Unit: approximately: 18.5 hours

September 2001



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

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An Integrated Unit for Grade 2

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This unit was written using the Curriculum Unit Planner, 1999-2001, which Planner was developed in the province of Ontario by the Ministry of Education. The Planner provides electronic templates and resources to develop and share units to help implement the new Ontario curriculum. This unit reflects the views of the developers of the unit and is not necessarily those of the Ministry of Education. Permission is given to reproduce this unit for any non-profit educational purpose. Teachers are encouraged to copy, edit, and adapt this unit for educational purposes. Any reference in this unit to particular commercial resources, learning materials, equipment, or technology does not reflect any official endorsements by the Ministry of Education, school boards, or associations that supported the production of this unit.



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Task Context

Based on the expectations of The Ontario Curriculum and the Catholic Graduate Expectations, the students will develop the skills necessary to restore an art exhibit for the Museum of Patterning. The exhibition contains three ancient pieces of patterning. These pieces include a dance pattern, a design pattern, and a musical pattern. Each of these pieces has been damaged by time and each of the pieces is missing part of its pattern. In the role of professionals in the art restoration business, each student will be responsible for repairing the patterns contained in the exhibition. When the pieces have been completely restored, the exhibition will be displayed to the class.

In completing the subtasks students will work to explore the concepts of patterning and algebra, numeration and geometry. The students will work collaboratively to focus on patterning, art, and musical skills that will facilitate the completion of the culminating task. These skills and new understandings will be consolidated through individual assignments and reflections in their Math journal on what they have come to understand, regarding the relevance of patterning to their world. The students will celebrate their achievements with each other.

In completing the tasks, the students will be expected to create new understanding by synthesizing familiar knowledge structures and new information. Students will experience patterns by first recognizing them. Later students will extend and create their own patterns. Students will be integrating expectations from the arts with expectations from mathematics. Students will also be expected to apply newly acquired skills and understandings to complete the culminating task. The idea that patterns can be discovered in many situations and can be used to solve problems is an ongoing theme throughout the unit.

Task Summary

By highlighting specific aspects of music, art, and dance, this unit encourages students to see the relevance of patterning to their world. Students will explore how number, pattern and shape are represented in the arts. Next, students will focus on specific patterning strategies, such as identifying and extending patterns, describing patterns, constructing, representing and extending patterns. The students will apply this newly learned knowledge to the world outside the classroom, with the restoration of an art exhibition for the Museum of Patterning.

Developing an understanding of Number Sense and Numeration is necessary in order to successfully complete the culminating task. Students will be ordering numbers as well as filling in missing numbers to complete numerical patterns. Students will use skip counting as well as addition and subtraction to create musical, design, and dance pieces.

Students will explore the way shape is used in music, art, and dance. They will begin by identifying shapes in several types of media (visual art, dance, and music). Students will create shapes in their own dances and in their designs. Students will discuss how each medium in art has a geometric relationship that is carefully planned.

The students will be asked to "restore" three ancient pieces of art housed in the Museum of Patterning. These pieces include a visual design, a piece of music, and a dance. All three of these pieces have been damaged by time and the elements.

Culminating Task Assessment

The students will restore the missing parts of three pieces contained in an ancient collection of art. In order to do this, students must first identify the pattern rules and extend the patterns found in each piece. As experts in art restoration, students will also be required to create and to add some of their own patterns to each piece so that they can make the finished product as beautiful as possible. The students will complete

their restorations individually. They will record their finished pieces on three separate blackline masters. After students have completed and recorded their restorations, they will share their finished products with the other students in the form of a multimedia celebration which will include a dance, a piece of visual art, and a piece of music. With these pieces, we seek to appreciate the many aspects of the gift of creativity. Students will look at the obvious as well as the hidden patterns in the creative work they do.

Catholic Graduate Expectations:

CGE 2c - presents information and ideas clearly and honestly and with sensitivity to others.

CGE 5d - finds meaning, dignity, fulfilment and vocation in work which contributes to the common good.

Links to Prior Knowledge

From previous grades it is expected that students will have a basic understanding of patterning skills and how to express and extend a pattern. An ability to recognize the basic geometric shapes would be an asset. As well, the following number skills are necessary:

- counting by 2, 5, and 10 on a number line;
- understanding basic concepts of adding and subtracting;
- a basic understanding of beat and rhythm in music and language.

Considerations

Notes to Teacher

The minor strands in this unit contain expectations from Numeration and Measurement. Expectations from the Visual and the Performing Arts are integrated throughout the unit. Naturally, expectations from each of the Language strands are inherent in this unit. The Language expectations are noted where they might be particularly addressed by a class or an individual student if the teacher should wish. The writing opportunities can be adapted to meet the needs of your students. These can be done in a group, orally, or on chart paper or individually in the students' learning logs.



Pattern Play in the Arts
Patterning Algebra & Numeration An Integrated Unit for Grade 2

1 Let's Explore Patterning in the Arts

Students will listen to and compose musical patterns, observe and design visual patterns, and move to and extend dance patterns. Students will discuss how number and pattern are important elements in music, art, and dance. Students will search for, identify, and extend patterns in each medium. This initial assessment can be used as a reference to gauge the students' knowledge of patterning, number sense and numeration, and shape.

Students are encouraged to use their individuality and creativity when examining mathematics in the arts.

Catholic Graduate Expectations:

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.

2 A Mathematical Artist~The Culminating Task

Students will be introduced to the culminating task which is to identify and extend patterns found in an ancient art exhibition which requires some restoration work before it is displayed at the "Museum of Patterning". This exhibition contains a numerical design, a piece of music and a dance. These ancient pieces of design, music and dance have all been damaged by time and the elements. Each student has been hired to restore the design, music and dance to their original quality. As we work toward celebrating our creative spirit, we remember that we are each individuals who need to be respected.

Catholic Graduate Expectations:

CGE 5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

3 Musical Patterns and Note Measurement

Students explore several simple pieces of music to find out how many counts are in each note and how many notes can be in a four count measure. The students will practise clapping and chanting a variety of musical patterns using four-count measures. The students will create a variety of their own four count measures. Students will work as reflective and creative thinkers. Students will reflect on how beautifully patterns are reflected throughout all of creation.

Catholic Graduate Expectations:

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems

CGE 3e - adopts a holistic approach to life by integrating learning from various subject areas and experience.



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

4 Patterns in Movement and Dance

Students will create and perform a sequential movement exercise in groups of approximately eight students. Students will work together in a circle to teach each other one movement, and to learn seven other movements from the other members of the circle. Each movement is made up of four simple actions using any part of the body in combination, done to a slow count of four. The group practises doing the entire sequence, several times watching each other, and a few times not watching each other. When the sequential movement is learned by all members it is performed to a piece of classical, four count music such as Pachelbel's Canon in D, Beethoven's Fifth Overture, or Jesu's Joy of Man's Desiring. Students will take on the role of a creator who is responsible for leading their fellow students in an rhythmic expression.

Catholic Graduate Expectations:

CGE 5a - works effectively as an interdependent team member.

5 Visual Art- Name Logo

In this activity, students will review what a pattern sounds like and looks like as a whole group then create patterns as a small group using pattern blocks. The students will individually create a pattern around their name which repeats three times, is creative and is visually appealing. Students are encouraged to use their individuality and creativity when designing and to encourage the work of others through positive, Christian comments.

Catholic Graduate Expectations:

CGE 5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

6 Patterns in Numeration- Hundreds Chart

Students will explore patterns on a hundreds chart. Students will independently explore multiples of 2, 3, 5 and 10 by skip counting on a hundreds chart and on a calculator. The patterns which result will be discussed in writing and orally.

7 Tell About Your Pattern- Guess My Rule

Students will solve problems where a series of numbers have been repeatedly added or subtracted by a fixed amount in order to create a pattern rule. Students will examine the rule, express the rule and continue to apply the rule in order to solve the problems. While working on written activities, the student will communicate appropriately.

Catholic Graduate Expectations:

CGE 2b - reads, understands and uses written materials effectively



Pattern Play in the Arts
Patterning Algebra & Numeration An Integrated Unit for Grade 2

8 Missing Parts~ Relationships in Patterns

In this activity, students will solve for unknowns in a variety of shape and number patterns. Students will be encouraged to first identify the number or shape rule. They will then discuss different strategies that can be used to solve for unknowns. Students will be encouraged to predict and act out patterns in unknown situations.

As the students work to solve these problems, they are reflecting on the richness of God's creation and the patterns which surround each of us.

Catholic Graduate Expectations:

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.

9 Museum of Patterning~Culminating Task

The students will restore the missing parts of three pieces contained in an ancient collection of art. In order to do this, students must first identify the pattern rules and extend the patterns found in each piece. As experts in art restoration, students will also be required to create and to add some of their own patterns to each piece so that they can make the finished product as beautiful as possible. The students will complete their restorations individually. They will record their finished pieces on three separate blackline masters. After students have completed and recorded their restorations, they will share their finished products with the other students in the form of a multimedia celebration which will include a dance, a piece of visual art, and a piece of music. With these pieces, we seek to appreciate the many aspects of the gift of creativity. Students will look at the obvious as well as the hidden patterns in the creative work they do.

Catholic Graduate Expectations:

CGE 2c - presents information and ideas clearly and honestly and with sensitivity to others.

CGE 5d - finds meaning, dignity, fulfilment and vocation in work which contributes to the common good.

10 An Artistic Presentation- Celebrating

The students will come together to present their restored pieces to the Museum of Patterning. The students will celebrate the work of one another and all human hands and nurture the attitude of wonder and awe for the fruit's of God's creation. Each student will present all three parts of their entry stressing God's role as creator, and focusing on the many gifts which are a part of each student. The peers will help reproduce the music and dance sections after each student has presented. Students celebrate their gifts from God which allow them to observe and create patterns in the beautiful world around them. Art critics may be invited to join in the celebration.

Catholic Graduate Expectations:

CGE 5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

CGE 2e - uses and integrates the Catholic faith tradition, in the critical analysis of the arts, media, technology and information systems to enhance the quality of life.

CGE 5c - develops one's God-given potential and makes a meaningful contribution to society.

CGE 2c - presents information and ideas clearly and honestly and with sensitivity to others.



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Description

Students will listen to and compose musical patterns, observe and design visual patterns, and move to and extend dance patterns. Students will discuss how number and pattern are important elements in music, art, and dance. Students will search for, identify, and extend patterns in each medium. This initial assessment can be used as a reference to gauge the students' knowledge of patterning, number sense and numeration, and shape.

Students are encouraged to use their individuality and creativity when examining mathematics in the arts.

Catholic Graduate Expectations:

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.

Expectations

- 2m83 • explore patterns and pattern rules;
- 2m84 • identify relationships between and among patterns.
- 2m82 • identify, extend, and create number, geometric, and measurement patterns, and patterns in their environment;
- 2m87 A – identify patterns (e.g., in shapes, sounds);
- 2m93 A – explain a pattern rule;
- 2m2 A • compare and order whole numbers using concrete materials, drawings, numerals, and number words to develop an understanding of place value;
- 2a29 • use the elements of design (colour, line, shape, form, space, texture), in ways appropriate for this grade, when producing and responding to works of art;
- 2a7 – identify rhythmic patterns (e.g., clap the pattern of syllables in nursery rhymes);
- 2a49 A • communicate understanding of works in drama and dance through discussion, writing, movement, and visual art work;
- 2e47 • communicate messages, and follow instructions and directions;
- 2m14 A – compare, order, and represent whole numbers to 100 using concrete materials and drawings;
- 2m9 – read and print number words to twenty;
- 2m15 – use mathematical language to identify and describe numbers to 100 in the world around them;

Groupings

- Students Working Individually
- Students Working In Small Groups

Teaching / Learning Strategies

- Brainstorming
- Chanting
- Direct Teaching

Assessment

Part A ~ Initial Assessment of Patterning

Observe students working on their patterns individually and in their groups. Expect words such as repeat, rhythm, counting, long, short, quick, fast, slow, pause, clap-stamp-clap-stamp, etc. Watch how effectively your students are able to transform a pattern that is being explained verbally into a sound pattern. Observe your students working individually to follow the pattern you are slapping, clapping, and snapping in "Mary had a Little Lamb". Observe how well they work in small groups to come up with their own sound compositions for their chosen rhyme or song. Children who are able to explain, transform and perform their patterns effectively and with ease, indicate a more advanced knowledge of patterning. Children who are having difficulty identifying, reproducing, and extending patterns should be noted for some review or remedial work in patterning. Our goal is to focus on helping students identify regularities in events, music, shapes, designs, and sets of



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

numbers. Through observing varied relationships of the same pattern, students can begin to identify its properties. Encouraging students to label and describe patterns, using words, sounds and other symbols, will prepare them to use variables later on in the unit.

Have students reflect on the following questions in their Math Journals.

1. What is a pattern?
2. Describe how there is math in music. Tell about how we can use counting and movement to go along with songs.
3. Draw or tell about the rhythm pattern they came up with for "Mary had a Little Lamb"

Use these particular Learning Log reflections to give you a general understanding of the class level of "patterning knowledge". As well, students may stand out as having either an advanced knowledge of patterning or a lack of "patterning knowledge"

Part B ~ Initial Number Sense and Numeration Assessment

While students are filling in the missing numbers in their blackline master, *Favourite Numbers* (BLM 1.1), move throughout the room observing

Teaching / Learning

Link Math to the Arts

Step 1

Introduce this Subtask, and the unit by explaining that "math" and, in particular, patterning, is all around us. Suggest that it is an important part of our daily lives because it allows us to understand, create, and extend meaning. Demonstrate that we can "hear", "see", and "move" to math. Play some music, show some artwork and do a simple movement to introduce art, music, and dance. Engage the class in a discussion: "What kind of math can we see, hear, or move to?" (Answers will vary: beat, numbers, rhythm, colours, pitch, music, shapes, addition, subtraction, notes, letters, space, etc.) Suggest that math is what makes the art, music, and dance we encounter in our everyday lives meaningful and fun. For additional activities and links to texts see the resource list.

Part A ~ Initial Assessment of Patterning

Exploring Patterning Through the Arts

Step 2

Tell the students that you are going to clap the rhythm to a song, but do not tell them what the song is going to be. Present the rhythm to the song "Mary had a Little Lamb" by clapping it out for the class. Tell the students that the rhythm you are clapping has a pattern in it that will help them recognize the song. See if any students can correctly identify the song. Point out to students that thinking about the patterns in music will

**Pattern Play in the Arts****Patterning Algebra & Numeration An Integrated Unit for Grade 2**

help us identify patterns in other situations. Have students sing the song "Mary had a Little Lamb" through several times, listening for any patterns they might hear. Brainstorm and record any patterns students identify on large chart paper at the front of the room. You may need to use symbols to help record some of the sound patterns.

Step 3

Stand before the students and slowly begin slapping your thigh once, clapping your hands once, and snapping your fingers twice. With non-verbal cues, encourage the students to imitate. When all the students are mimicking the pattern, begin to count out: one-two-three-four, one-two-three-four. Again encourage students to mimic. Next, chant the words "Mary had a Little Lamb". Sing the entire song through singing, while you keep the slapping, clapping and snapping, snapping pattern going.

Step 4

Divide the students into small groups. Have students work together to come up with their own rhythm pattern for "Mary had a Little Lamb". Students might choose another simple rhyme with a four count beat, such as "Twinkle Twinkle", "Row Row Row Your Boat", or "Three Blind Mice". Encourage student groups to experiment with stomping, counting, clapping, slapping, snapping, moving, etc. Remind students to ensure their pattern fits the one-two-three-four count that goes along with the song. Students will present these four-count rhythm patterns to the class by performing them in their small group, while chanting/singing their chosen rhyme/song.

Step 5

Have students reflect on some of the following questions in their Math Journals. Discuss and model in writing the children's answers to the following questions.

1. What is a pattern?
2. Describe how there is math in music. Tell how we can use counting and movement to go along with songs.
3. Draw or tell about the rhythm pattern they came up with in their group for "Mary had a Little Lamb".

Part B ~ Initial Number Sense and Numeration Assessment**Step 6**

This is a design activity. Students will work individually using random number patterns to create designs. Distribute blackline master *Favourite Numbers* (BLM 1.1). Have students circle 40 of their favourite numbers from one to one hundred on the chart. Students then transfer these circled numbers by writing them down in numerical form into the boxes on page 2 of the blackline master *Favourite Numbers* (BLM 1.1). For example, if a student circled number "twenty-three" as one of their favourite numbers, then they would write "23" in a box on page 2. Have the children fill in all the missing numbers. Encourage students to pair a larger number with a smaller number as this will create a more effective design.

Step 7

Distribute *Random Numbers* (BLM 1.2) and have students fill in the missing numbers on the diamond. e.g., 1,2,3,4 and the 5 are there. This BLM can be enlarged to accommodate all students. Students will now use the 40 favourite numbers they chose from *Favourite Numbers* (BLM 1.1) as beginning and end points on *Random Numbers* (BLM 1.2). For example, if a student circled and listed the numbers 0, 47, 19, 83, 65, 30, ... the student would connect point 0 to point 47 using a ruler and drawing a straight line, then point 19 to point 83, then point 65 to point 30, until all 20 lines have been drawn. Students may wish to colour their designs if time allows.

Step 8

Have students share their finished products with each other. Have them discuss which designs are more artistic and why. Have students think about and answer the following questions regarding the numbers they



Pattern Play in the Arts

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chose to complete their designs. Choose the questions which you feel best suit the needs of your students. These questions should be adjusted to meet the level of your students. Keep in mind the Level 4 student and use remedial work in numeration for students having difficulty. Students would record these answers in their Math Journals. Discuss and model in writing the children's answers to the following questions.

1. How many of the numbers you chose on the *Favourite Numbers* (BLM 1.1) sheet were less than 50?
2. How many of your numbers were greater than 50?
3. You used 40 numbers. How many were on each side of the diamond on *Random Numbers* (BLM 1.2)?
4. How many of your first numbers are the same?
5. How many of your last numbers are the same?
6. How much more was the greatest number than the least?

Part C ~ Initial Assessment of Shape

Step 9

Students will create shapes and measure out steps to follow a simple dance routine. Students will begin by learning the "box-step". Arrange the class into groups of four students standing in a square formation. The students would be facing each other in each square. The "box-step" is a four-count step that will have them back where they started by the count of four. On Step 1 students step forward on their right. On Step 2 they crossover their right foot with their left foot. On Step 3 they step back with their right. On Step 4 they step back with their left. See resource lists for optional links to other texts.

When students have mastered four counts, have them extend the dance to eight counts by repeating the "box-step" twice. After sufficient practice have groups demonstrate for the rest of the class. Ask students some questions about the shapes they are making when they dance. For example, students might respond verbally to the following:

1. What shape is your group standing in at the beginning of your dance? (square)
2. How does it change when you've all stepped forward? (a smaller square)
3. How does it change when you've all stepped backward? (a larger square)

You may wish students to record some of these questions and answers in their Math Journal.

Step 10

Modelling Shapes with Dance Steps

Have students work in their same groups to come up with dances that form a variety of shapes, including triangles, circles, ovals, rectangles, hexagons, other polygons... Students might also want to begin a dance in one shape and transform into a different shape by the end of their dance. They might continue to use the "box-step" in their dances or they might use their own simple steps (e.g., marching, stepping forward and backward, side-stepping, sliding, etc.) to form their shapes. Allow time for groups to practice and perform their dances. If time allows they may even like to teach their dance to the other groups.

Step 11

If there is extra time for a "cool down" have individual students practice making shapes by moving their bodies. Ask, "Can you walk in a circle? in a square? in a hexagon? Can you hop in a circle? in a square? Can you hop sideways in a triangle? Try jumping forwards in a rectangle". Ask students how many geometric shapes they can make with their body. "Can you make the shape of a circle with your arms?" Can you make the shape of a circle with your legs?" Repeat, using other geometric shapes and other body parts. You may choose individual students to model the shapes they can make using their bodies. Have students write about the following in their Math Journals. Discuss and model in writing the children's answers to the following questions.

1. Name as many shapes as you can.
2. Pick two shapes and tell how they are the same.
3. Pick two shapes and tell how they are different.
4. Is it easy to make shapes with your body? Why or why not?



Pattern Play in the Arts

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Adaptations

The suggestions offered in this section will help facilitate discussion and sharing of important information between the teacher, the support team and the parents, in meeting the individual needs of the student. Individual students have unique needs. It is important to recognize that a team may already have been assisting the student and his or her family in recognizing and implementing solutions that work successfully. These suggested learning accommodations are intended to assist the classroom teacher in beginning to understand the implications for instruction and management. They are meant to be a practical support to be used in conjunction with the IEP and recommendations made by special education and support service personnel, who may assist the student as well as the parent(s). Make arrangements with the student, if necessary, for alternative methods of being recognized other than dancing.

The following adaptations may also be used, especially useful with ESL students:

- provide plenty of concrete and visual support - models, charts, graphs, maps, pictures, flashcards, diagrams, films, videos, vocabulary lists, toys, posters, banners, word games;
- teach students how to paraphrase, organize and present material;
- simplify text or have available textbooks with material at a variety of reading levels/complexity;
- use many non-verbal cues, (e.g., gestures, facial expressions);
- explain body language - meaning and what's appropriate/acceptable;
- incorporate jigsaw/cooperative learning strategies into the program;
- have students work with partners from the same linguistic background who can act as interpreters, classroom partners and peer tutors;
- provide project checklist with timelines and essential resources;
- send home short description of project and keep parents informed/involved;
- make sure that students can see and hear clearly, (e.g., avoid placing them at the back of the room).

Resources



Favourite Numbers/Random Numbers

subtask_1.cwk



Quest 2000 Grade Two Program

Addison-Wesley



Interactions Grade Two Program

Ginn Publishing

Notes to Teacher

By highlighting specific aspects of music, art, and dance, this Subtask encourages the children to see the relevance of patterning to their world. This Subtask will also help the students see that numbers, shape, and measurement are important elements in music, art and dance. This Subtask sets the stage for integration of several of the Mathematics strands with several of the strands from the Arts. It provides students with a cross-curriculum link to math, music, art, and dance. Each of the activities in this first Subtask can be extended depending on the interest and skill level of your group.

Teacher Reflections



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

120 mins

Description

Students will be introduced to the culminating task which is to identify and extend patterns found in an ancient art exhibition which requires some restoration work before it is displayed at the "Museum of Patterning". This exhibition contains a numerical design, a piece of music and a dance. These ancient pieces of design, music and dance have all been damaged by time and the elements. Each student has been hired to restore the design, music and dance to their original quality. As we work toward celebrating our creative spirit, we remember that we are each individuals who need to be respected.

Catholic Graduate Expectations:

CGE 5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

Expectations

- 2m88 A – combine two attributes in creating a pattern (e.g., size and position);
- 2m85 A – recognize that patterning results from repeating an operation (e.g., addition), using a transformation (slide, flip, turn), or making some other change to an attribute (e.g., position, colour);
- 2m92 – relate growing and shrinking patterns to addition and subtraction;
- 2m94 – given a rule expressed in informal language, extend a pattern;
- 2m95 A – transfer patterns from one medium to another (e.g., actions, words, symbols, pictures, objects, calculator).
- 2a6 A – identify examples of beat in their environment and in music (e.g., ticking of clocks, steady pulse in rhymes or songs);
- 2a67 – identify specific aspects (e.g., movements, words) of their work and that of others that were effective (e.g., the scary way the dancer stopped and turned).
- 2e30 • express clear responses to written materials, relating the ideas in them (thoughts, feelings, experiences) to their own knowledge and experience;

Groupings

- Students Working In Pairs
- Students Working Individually

Teaching / Learning Strategies

- Learning Log/ Journal
- Think / Pair / Share
- Problem-solving Strategies

Assessment

Use *Pattern Boxes* (BLM 2.1), *Visual Restoration* (BLM 2.2), *Musical Restoration* (BLM 2.3), and *Dance Restoration* (BLM 2.4) to look for a general understanding of the culminating task (restoring patterns in art). Also look for a general understanding that "doing math" will be inherent in the task. Use the blackline masters to assess the students' ability to use mathematical language effectively. Look for math vocabulary particularly in the area of patterning, shape, and numeration. Look for the knowledge that being able to identify and reproduce patterns is necessary in order to restore and extend them properly. Use the following rating scale if desired, to assess the students:

Level 4 The student has correctly identified the pattern. The student has created, reproduced or extended the pattern with no mistakes and no omissions. The student is able to talk about this pattern rule using precise language. The student is clear and



Pattern Play in the Arts

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120 mins

confident, always using appropriate mathematical language.

Level 3 The student has correctly identified the pattern. The student has created, reproduced or extended the pattern with few mistakes or omissions. The student is able to tell about this pattern rule with clarity and precision. The student usually uses appropriate mathematical language.

Level 2 The student has partly identified the pattern. The student has created, reproduced or extended the pattern with some mistakes and some omissions. The student is able to tell about this pattern rule with some clarity and some precision. The student sometimes uses appropriate mathematical terminology.

Level 1 The student required assistance to correctly identify the pattern. The student has created, reproduced or extended the pattern with major errors and omissions. The student is unclear and imprecise when telling about this pattern rule. The student rarely uses appropriate mathematical terminology.

Have students reflect on the following in their Learning Logs/ Math Journals.

Teaching / Learning

The Meaning of Math in the Arts

Step 1

Remind students about the previous discussions which revolved around shape, pattern, and numbers in the arts. Have them think about some of the patterns they encountered in Subtask 1. Ask students why they think patterns and numbers are important in the arts. Record these answers and display them in a prominent place in the classroom so that you can refer back to them throughout the unit.

Making Patterns

Step 2

Inform the students that the Museum of Patterning would like to see some of their patterning work because they are interested in hiring some experts to do restoration work on an ancient and very valuable exhibition now housed in the museum. Explain to the students that this pattern has been damaged by time and is missing parts of its pattern. Distribute *Pattern Boxes* (BLM 2.1). Students are to use three colours to fill in the square grid with a pattern. Make sure students repeat the same pattern in each square of the grid

Step 3

After having collected the students' finished pattern boxes and after having "sent them off to the Museum of Patterning to be examined", inform the students that they have each been hired by the Museum of Patterning



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

120 mins

2,4,6,8...

to restore an exhibition of Patterning in the Arts. The exhibition includes three damaged pieces. They are a dance piece, a piece of visual art, and an instrumental interpretation written with four beats per measure. Each of these pieces must be restored as nearly as possible to its original quality and beauty. Inform students that over the next few days, they will be trained in some of the methods and skills they will be using in their restoration work. Inform students that when they have finished restoring the three pieces they will share the completed work with their peers before returning the exhibition to the Museum for display.

Step 4

Distribute *Visual Restoration* (BLM 2.2). Read the instructions together and have students complete this blackline master. Students can use colour tiles or another manipulative to help create the pattern. Distribute *Musical Restorations* (BLM 2.3) after they have completed BLM 2.2. Read the instructions together and have students complete the blackline master. Distribute *Dance Restoration* (BLM 2.4) to each student. Read instructions and complete together. Remind the students to be creative with all their restoration work because there is no right or wrong answers. The only restriction is that they need to continue and remain accurate to any patterns or pattern rules they identify in each of the three pieces. In *Restoration of Music* (BLM 2.3) the student must repeat the pattern at least once. It may be best to show several examples of pictures, words and symbol possibilities on the blackboard and highlight the sound of the pattern repeating. For example, snap, stomp, snap, stomp, slap, clap, slap, clap, snap stomp, snap, stomp. There could be three lines to the pattern that repeat or two lines that repeat, or any number of lines, so long as the pattern repeats.

Step 5

Have students restore each of their own visual, musical and dance patterns. Students should write about the different patterns they saw in their own work and the work of their peers. Have students answer some of the following questions in their Math Journals. Discuss and model in writing the children's answers to some of the following questions.

1. What patterns did you see in the visual, musical and dance pieces you restored?
2. How can you communicate patterns in dance?
3. What do you like about patterns in art?

Adaptations

The suggestions offered in this section will help facilitate discussion and sharing of important information between the teacher, the support team and the parents, in meeting the individual needs of the student. Individual students have unique needs. It is important to recognize that a team may already have been assisting the student and his or her family in recognizing and implementing solutions that work successfully. These suggested learning accommodations are intended to assist the classroom teacher in beginning to understand the implications for instruction and management. They are meant to be a practical support to be used in conjunction with the IEP and recommendations made by special education and support service personnel, who may assist the student as well as the parent(s). Make arrangements with the student, if necessary, for alternative methods of being recognized other than dancing.

Examples:

- students in a wheelchair may use their upper body for the dance
- physically challenged students may verbally instruct someone else to do the dance
- students may wish to act out the dance with dolls
- students may draw pictures depicting their dance (stick people)

Accommodations that may be used to address ESL students are provided in subtask 1.













Resources



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

120 mins

	Pattern Boxes	subtask_2.1.cwk
	Visual Pattern	subtask_2.2.cwk
	Musical Pattern	subtask_2.3.cwk
	Dance Pattern	subtask_2.4.cwk
	Visiting the Art Museum	L.K. Brown and M. Brown
	Rhythms, Music, and Instruments to Make	J. Hawkins and M. Faulhaber
	The Kodaly Method	Lois Choksy
	Teaching Music at Beginning Levels through the Kodaly Concept,	The Kodaly Musical Training Institute
	Picasso and the Cubists	McCall Publishing Company
	Practical Patchwork and Applique Techniques	G. Lawther
	Quest 2000- Grade 2	Addison Wesley
	Interactions Grade Two	Ginn Publishing

Notes to Teacher

Since the majority of students' written work will be completed on blackline masters in this Subtask, be sure to prompt children to extend their thinking. Ask questions periodically while they are working such as: What number/shape/colour would come next in the pattern? How do you know? Why did you choose those colours/numbers/symbols/shapes to work with? How are you finding out what the pattern rule is? How are you using the rule to help you extend the pattern? Students who are finished early may wish to create original counting and colouring patterns on a hundreds chart.

Enrich the students with opportunities to reference Canadian artists such as The Group of Seven. A visit to a museum would be beneficial to help develop an experience base for those who may not have the needed experience or language.

Teacher Reflections



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Description

Students explore several simple pieces of music to find out how many counts are in each note and how many notes can be in a four count measure. The students will practise clapping and chanting a variety of musical patterns using four-count measures. The students will create a variety of their own four count measures. Students will work as reflective and creative thinkers. Students will reflect on how beautifully patterns are reflected throughout all of creation.

Catholic Graduate Expectations:

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems

CGE 3e - adopts a holistic approach to life by integrating learning from various subject areas and experience.

Expectations

- 2a16 – create simple patterned movement to familiar music, using their knowledge of beat and rhythm;
- 2a15 A – create rhythmic and melodic patterns (e.g., ostinati), using a variety of sounds (e.g., vocal and instrumental sounds);
- 2a19 – accompany songs in an expressive way, using appropriate rhythm instruments, body percussion, or “found” instruments;
- 2m40 – record the results of measurement activities in a variety of ways (e.g., in graphs, stories);
- 2m55 A – use non-standard and standard units to solve measurement problems relating to themselves and their environment;
- 2m19 – represent and explain halves, thirds, and quarters as part of a whole and part of a set using concrete materials and drawings (e.g., colour 2 out of 4 circles);
- 2a6 – identify examples of beat in their environment and in music (e.g., ticking of clocks, steady pulse in rhymes or songs);
- 2a7 – identify rhythmic patterns (e.g., clap the pattern of syllables in nursery rhymes);
- 2a8 – distinguish between beat and rhythm in a variety of pieces of music;

Groupings

- Students Working Individually
- Students Working In Pairs

Teaching / Learning Strategies

- Direct Teaching

Assessment

Use regular questions posed to individual students throughout the introduction of each new musical note. Ask individual students to mimic the clapping patterns you have just performed. Watch and listen to ensure that students are attaching the correct note value to each of the four notes. Use the blackline master, *Note Value* (BLM. 3.5) to evaluate how well the students equate the value of each note to its symbol. You may wish to apply the following rating scale to the students' finished *Note Value* (BLM 3.5).

Level 4 The student completed BLM 3.5 independently. They applied the concept of note value by clapping notes and completing four-count measures with practically no mistakes or omissions. They accurately created their own four-count measures by modifying what they have learned about note value.

Level 3 The student completed BLM 3.5 Note Value independently. They applied the concept of note value by clapping



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

notes and completing four-count measures with few mistakes or omissions. They created their own four-count measures.

Level 2 The student completed BLM 3.5 Note Value with limited assistance. They applied the concept of note value by clapping notes and completing four-count measures with several minor errors or omissions. They needed some assistance to create their own four-count measures.

Level 1 The student completed BLM 3.5 Note Value with assistance. They applied the concept of note value by clapping notes and completing four-count measures with major errors and/or omissions. They created their own four-count measures with regular assistance.

Have students write in their Learning Logs. Ask students to write about what they have learned about four-count measures. Have them address the following questions.

1. Why do we use notes in music?
2. Is there measurement in four-count measures?
3. Tell about any patterns you saw in the music we clapped?

Use the students' entries in their Learning Logs to give you an understanding of how well students understand that there is

Teaching / Learning

Linking Number to Music

Step 1

Remind students about the patterns they slapped, clapped and snapped in "Mary had a Little Lamb". Sing the song together again and have the students follow you in slapping your thigh once, clapping your hands once, and snapping your fingers twice. Remind students that it is the patterns in music that helps us recognize songs. Have students take turns clapping out the rhythm to familiar songs and nursery rhymes. See if other students can recognize the song by its pattern. Conclude by telling students that in math, numbers tell us how to count. In music, the notes and rhythm tell us how to clap.

It might be beneficial to review the grade two expectations for representing halves, thirds, and quarters as part of a whole and part of a set. It is advisable to use manipulatives, concrete materials, and drawings for this activity. For example, you may ask them to colour 2 out of 4 circles. Fraction circles and play dough are other possibilities. You may choose to continue using visual representations of fractions throughout the remaining steps.

Explaining Note Value and Measures



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Step 2

Begin by affixing a large quarter note to the chalkboard, provided in *Quarter Note* (BLM 3.1). Tell students that it is a music note called a quarter note. Affix the *Eighth Notes* (BLM. 3.2), *Half Note* (BLM. 3.3), and *Whole Note* (BLM. 3.4) to the chalkboard while you identify them by name. Tell the students that these are all music notes but they have different names and they are clapped in a different way. Print the names of the notes under each blackline master on the board. Inform the students that the solid note is a quarter note, the two notes joined together are eighth notes, the hollow note with a stick is a half note, and the hollow note without a stick is a whole note.

Step 3

Quarter Notes

Point at the quarter note (BLM. 3.1). Have students listen as you clap a quarter note. Point at the note on the board and clap once. Have the students repeat. Next, have students listen as you clap four quarter notes in a row. Inform students that this is called a four count measure. You may want to draw four quarter notes in a row on the board to show how you would record this four count measure. Have students repeat the pattern with you, while you chant "walk, walk, walk, walk". Say the word "walk" each time you clap, at a steady speed, to help with the regular timing of the four count measure. Reinforce with students that this is similar to counting to 4. e.g. $1+1+1+1=4$. You may write the fraction $1/4$ on the board as well.

Step 4

Eighth Notes

Point at the eighth notes on (BLM 3.2 Eighth Notes). Have students listen as you clap a quarter note. Point at the note on the board and clap two quick claps together. Have the students repeat. Next, have students listen as you clap a four count measure by clapping your hands eight times (twice per eighth note). You may want to draw four eighth notes on the board to show how you would record this four count measure. Have students repeat the pattern with you, while you chant "running, running, running, running". Clap twice each time you say "running". Ask students if they noticed a difference between how you clapped the quarter note and how you clapped the eighth note.

Step 5

Half Note

Point at the half note (BLM. 3.3 Half Note). Have students listen as you clap a half note. Clap your hands closed and bounce hands forward for a count of two. Ask students if they noticed a difference between how you clapped the quarter, eighth and half notes. They should notice the silent bounce in the half note. Have students repeat by mimicking you. Draw two quarter notes on the board and lead students in "reading" the pattern, clapping hands closed and bouncing hands forward for a count of two for each note. Call on individual students to clap two half notes. Students might repeat the word "jo-og" while they clap out the half note to help them with the timing. They clap for "jo-" and bounce their closed hands silently when they say the "-og". You may write the fraction $1/2$ on the board as well.

Step 6

Whole Note

Have students listen as you clap a whole note. Point at the half note on the board (BLM. 3.4 Whole Note). Clap your hands closed once and bounce hands forward three times for a total count of four. Ask students if they noticed a difference between how you clapped the half notes and the whole notes. They should notice the three silent bounces in the whole note. Have students repeat by mimicking you. Draw one whole note on the board and lead students in "reading" the pattern, clapping hands closed and bouncing hands forward three times for a count of four, for each note. Call on individual students to clap a whole note. Students might repeat the word "jogging slowly" while they clap out the half note to help them with the timing. They clap for "jog" and bounce their hand silently when they say the "ing slow-ly".



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Step 7

Check for Understanding of Note Value

Distribute blackline master, *Note Value* (BLM. 3.5) to the students. Have students notice that the patterns on the blackline master have quarter, eighth, half and whole notes mixed up in the patterns. Point out that each line is a four-count measure because there are four beats per line. Inform students by demonstrating that sometimes these beats are clapped once as in a quarter note, sometimes a beat is clapped with two quick claps as in an eighth note, and sometimes these beats are silent as in the half and whole notes which you show by bouncing your closed hands together. Review clapping the count and the word that goes with each note by following the information on the first part of *Note Value* (BLM 3.5). Do this as a teacher led activity. Refer often to the blackline masters that you have already affixed to the board (BLM 3.1, BLM 3.2, BLM 3.3, BLM 3.4)

Step 8

Have students complete the blackline master, *Note Value* (BLM 3.5) with a partner. Have students practice clapping the finished patterns together. Take up the exercise as a class. Have students hand in the blackline master for marking. In their Math Journals, have them write an entry where they record what they have learned about note value. You may wish them to answer some of the following questions. Discuss and model in writing the children's answers to the following questions.

1. What have you learned about counting today?
2. What did you learn about fractions today?
3. Why do you think we need to give notes a name and a value (beat)?
4. Do you think all music should be written in four-count measures?

Adaptations

For these activities, non-readers and writers can work with peer helpers or peer tutors. In addition you may:

- provide a structured overview of the lesson prior to beginning instruction;
- announce what you are going to say before you say it, say it, then say what you said. This kind of structure helps to 'glue' the ideas in place;
- use outlines, teach outlining and underlining to help structure and shape what is being learned as it is being learned;
- use visual aids, demonstrations, simulations and manipulatives to ensure that students understand concepts presented;
- make use of overheads and keep each overhead for later review by the student;
- provide a copy of peer or teacher notes to allow student to focus on listening;
- provide opportunities to 'pair share' or activity breaks to assist the student's ability to focus on instruction;
- make use of computer technology where possible;
- include a variety of activities for the student in each lesson;
- preteach important vocabulary;
- directly teach the skills necessary to manage instructional materials;

Accommodations for ESL students are provided in subtask 1.

Resources

	Quarter Note	subtask_3.1.cwk
	Eighth Note	subtask_3.2.cwk
	Half Note	subtask_3.3.cwk
	Whole Note	subtask_3.4.cwk



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2



Note Value

subtask_3.5.cwk



150 Folk Songs to Sing, Read and Play

Kodaly Musical Training Institute



Quest 2000 Grade Two

Addison Wesley



Interactions Grade Two

Ginn Publishing



modelling clay



fraction circles

1

Notes to Teacher

Teacher Reflections



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

120 mins

Description

Students will create and perform a sequential movement exercise in groups of approximately eight students. Students will work together in a circle to teach each other one movement, and to learn seven other movements from the other members of the circle. Each movement is made up of four simple actions using any part of the body in combination, done to a slow count of four. The group practises doing the entire sequence, several times watching each other, and a few times not watching each other. When the sequential movement is learned by all members it is performed to a piece of classical, four count music such as Pachelbel's Canon in D, Beethoven's Fifth Overture, or Jesu's Joy of Man's Desiring. Students will take on the role of a creator who is responsible for leading their fellow students in an rhythmic expression.

Catholic Graduate Expectations:

CGE 5a - works effectively as an interdependent team member.

Expectations

- 2p20 A – travel in a variety of ways, changing pathways and directions (e.g., in creative dance, dances from other countries);
- 2a60 – demonstrate the ability to move and control their bodies in space and time (e.g., by creating tableaux in small groups);
- 2a48 • create short dance pieces, using techniques learned in this grade;
- 2a50 A • solve problems in various situations through role playing and movement in drama and dance.
- 2m44 – select an appropriate non-standard unit and an appropriate standard unit to measure length;
- 2m88 – combine two attributes in creating a pattern (e.g., size and position);
- 2m94 A – given a rule expressed in informal language, extend a pattern;
- 2m95 A – transfer patterns from one medium to another (e.g., actions, words, symbols, pictures, objects, calculator).
- 2e59 – use appropriate gestures and tone of voice, as well as natural speech rhythms, when speaking;
- 2e55 – use appropriate vocabulary and oral language structures to express emotions in a variety of situations;

Groupings

Students Working In Small Groups

Teaching / Learning Strategies

Collaborative/co-operative Learning
 Demonstration
 Improvisation

Assessment

The students will be working in groups to create a sequential movement exercise. They will be given sufficient time to learn and practise this exercise. When they have learned their sequential movements, each group will perform their sequence to music. Use this performance task to determine how well they can, given a rule in informal language, extend a pattern. Also, look for their ability to combine different attributes to create a pattern. Record their ability level when it comes to transferring a pattern from one medium to another. You may wish to use the provided rubric, *Sequential Patterns in Dance* to help you record your observations during each performance task.

Assessment Strategies

Observation
 Performance Task

Assessment Recording Devices

**Pattern Play in the Arts****Patterning Algebra & Numeration An Integrated Unit for Grade 2**

Anecdotal Record Rubric

Teaching / Learning**Patterns in Dance****Step 1**

Divide the class into groups of eight. (Groups of eight work best and these instructions are for a group of eight but if it is necessary you can easily adapt the instructions for use with groups of other sizes.) Groups with even numbers are necessary because the music is written in four-four time. The teacher can join a group if necessary to make it even. Each group forms a circle so that the members have room to swing their arms freely, all facing inward. Ensure that all students can see and hear the teacher.

Teaching-Learning Pattern Sequence**Step 2**

The teacher or a volunteer makes up and demonstrates four simple unclassified movements, using any parts of the body in combination, done to a slow count of four; that is, there is no stopping between "one" and "two" and "three" and "four". The speed of the count should be steady. You may wish to play music while the movements are being taught to help with the timing. Any classical or four beats per measure music would be fine. The demonstrator (teacher or volunteer) teaches this series of four movements to all members of the group. As soon as they have all learned it, the student to the right of the volunteer, beginning in the first number-four position of series one, makes up and demonstrates the second series of four simple and unclassified movements, using any parts of his body and, as before, teaches his series to the rest of the group in his circle. The movement each student makes up and teaches the group can be one fluid movement done to the slow count of four or it can be made up of four specific positions in sequence done to the slow count of four. It is suggested that you turn the music off while individual students teach their groups their movements. When the groups have learned their sequence they will perform their sequence to music (Step 4)

Group Co-operation to Perform Pattern Sequence**Step 3**

This teaching/learning continues around the circle until all members of the group (if it's a group of eight) have taught one series and learned seven. Remind students that they are following a one-two-three-four pattern and that they should count periodically to ensure their movements follow the pattern (Play the music for a few minutes to help them with timing if necessary). The total count for a group of eight will be thirty-two. In some instances, where there is a group of seven, the group will need to make up an extra movement of four counts. The teacher can direct the group to make sure that the last count of four leads the group towards the first person's beginning position so that when the sequence is run through twice in a row there is no rapid or awkward movement to begin the sequence again. Group co-operation is necessary to work through problems and modify the movements so that each member's physical capabilities can be met. The group practices doing the entire sequence, several times watching each other, a few times not watching each other (a self-test) and then watching to reinforce or relearn. Students should be encouraged to watch for the pattern inherent in the repeated movements of their group.

Performing the Pattern to Music**Step 4**

The next step, which may be introduced while practising is in progress, is to play a piece of instrumental music that develops in thirty-two bar sections of 4/4 time (virtually all classical pieces do). Have the group display their unclassified sequential movements to music. Once the groups have learned the movements the music should be played several times so that the groups can fit the movements to the music. When the students are ready they can perform their sequence to the other groups in the class. Encourage the members of the class to look for patterns in the sequences they see and in the music they hear.



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Learning Logs

Step 5

Have students answer some of the following questions in their Learning Logs or Math Journals. Discuss and model in writing the children's answers to the following questions:

1. What made each group's pattern rule different?
2. What made each group's pattern the same?
3. What does the sequence of movements you performed have in common with other dances you have seen or you have done?

Adaptations

The suggestions offered in this section will help facilitate discussion and sharing of important information between the teacher, the support team and the parents, in meeting the individual needs of the student. Individual students have unique needs. It is important to recognize that a team may already have been assisting the student and his or her family in recognizing and implementing solutions that work successfully. These suggested learning accommodations are intended to assist the classroom teacher in beginning to understand the implications for instruction and management. They are meant to be a practical support to be used in conjunction with the IEP and recommendations made by special education and support service personnel, who may assist the student as well as the parent(s). Make arrangements with the student, if necessary, for alternative methods of being recognized other than dancing.

Examples:

- students in a wheelchair may use their upper body for the dance
- physically challenged students may verbally instruct someone else to do the dance
- students may wish to act out the dance with dolls
- students may draw pictures depicting their dance (stick people)

Accommodations for ESL students are provided in subtask 1.

Resources



Sequential Patterns in Dance



Quest 2000 Grade Two

Addison Wesley



Interactions Grade Two

Ginn Publishing



Essentials of Music



CD player or stereo with cassette player



large open space for students to work in groups



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Notes to Teacher

This sequential dance is initially led by the teacher. The essential characteristic of unclassified sequential movement to music is that the beginning structure is suggested by the teacher; the content belongs to the students. It is the students who are transforming patterns from informal language to patterns in movement, space and time. The experiences they have already recorded in their study of the four count measure will help them divide their movements up into four beats. Students and observers of this exercise often comment how beautiful it is when performed. The patterns the students observe are often described as looking "like a ballet" and "very beautiful". This activity can be extended and performed using movements that could be recognized easily to tell a story.

Teacher Reflections



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Description

In this activity, students will review what a pattern sounds like and looks like as a whole group then create patterns as a small group using pattern blocks. The students will individually create a pattern around their name which repeats three times, is creative and is visually appealing. Students are encouraged to use their individuality and creativity when designing and to encourage the work of others through positive, Christian comments.

Catholic Graduate Expectations:

CGE 5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

Expectations

- 2m82 A • identify, extend, and create number, geometric, and measurement patterns, and patterns in their environment;
- 2m83 • explore patterns and pattern rules;
- 2m84 • identify relationships between and among patterns.
- 2m87 – identify patterns (e.g., in shapes, sounds);
- 2m93 A – explain a pattern rule;
- 2m95 A – transfer patterns from one medium to another (e.g., actions, words, symbols, pictures, objects, calculator).
- 2a28 • produce two- and three-dimensional works of art that communicate ideas (thoughts, feelings, experiences) for specific purposes and to familiar audiences;
- 2a15 – create rhythmic and melodic patterns (e.g., ostinati), using a variety of sounds (e.g., vocal and instrumental sounds);
- 2e1 • communicate ideas (thoughts, feelings, experiences) for specific purposes (e.g., write a paragraph describing a trip to the farm for classmates);

Groupings

Students Working As A Whole Class
Students Working In Small Groups
Students Working Individually

Teaching / Learning Strategies

Demonstration
Discussion

Assessment

Formative assessment by the teacher observing how the students create and extend patterns and their ability to create the artwork.

The teacher reads the math journals/ learning logs to determine if the students can explain their pattern rule.

The teacher uses the rubric to determine and record the level at which the student is working.

Assessment Strategies

Exhibition/demonstration
Observation
Learning Log

Assessment Recording Devices

Anecdotal Record
Rubric

Teaching / Learning

Step 1

The teacher will review patterning. By asking the students the definition of a pattern - something that repeats. Asking the class to think- What could a pattern sound like? Demonstrate a few examples- slap, clap, snap, snap, slap, clap, snap, snap... Ask the students to demonstrate examples.



Pattern Play in the Arts

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Step 2

The teacher asks: What could a pattern look like? Demonstrate examples- drawing circle, square, triangle, circle, square, triangle... on the chalk board or chart paper. Ask the students for examples.

Step 3

The teacher asks the students to think of any patterns they can see or hear in the world. Discuss.

Step 4

In small groups (each group has a quantity of pattern blocks) students are asked to create a pattern on their tables, using as many of the blocks as they can in the time allotted.

Step 5

The teacher stops work when appropriate and leads a short discussion about the patterns which have been created. Students are invited to wander to see the other groups patterns.

Step 6

The groups are then asked to put the pattern blocks away and gather in front of the teacher. The teacher describes the individual task. Students will be given a large piece of white paper. Their job is to advertise their name. Discuss what an ad or commercial is using student examples. Discuss product logos. Students put their first, or first and last name on the paper and then decorate it with a pattern and colour. The pattern must repeat at least three times in colour. The teacher produces or shows an example. The students may use the pattern blocks to trace or create their own objects such as star, moon, circle, square, squiggle... around their name. It is suggested the student use pencil and then colour over the pencil.

Step 7

When finished the students reflect on the following questions in their Math Journals. Discuss and model in writing the children's answers to the following questions.

- Describe your pattern using pictures and words.
- Explain how your pattern repeats or explain the rule needed to make that pattern.

Step 8

For closure the teacher could gather the students together and ask individuals to share their ads by reading their patterns aloud.

Adaptations

This activity could be adapted to meet the individual needs of the students.

Students having difficulty could be directed to place pattern blocks around their name in a pattern and then trace the blocks and colour them in.

The teacher should pre teach any vocabulary involving the pattern blocks to the students.

The computer could be used here for a student to complete a visual pattern around their name.

The use of a scribe to record the student's response in their learning log may be appropriate.

Accommodations for ESL students are provided in subtask 1.

Resources



Name Logo




large white art paper

1



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

 coloured pencils, markers, crayons or
pastels

 pattern blocks

1 bucket

Notes to Teacher

This activity could be extended further by having students create paper woven placemats and apple or potato pattern prints.

The teacher could use resource books or picture books showing patterns in art.

A visit to an art museum or exhibit would be an excellent field trip.

Teacher Reflections



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Description

Students will explore patterns on a hundreds chart. Students will independently explore multiples of 2, 3, 5 and 10 by skip counting on a hundreds chart and on a calculator. The patterns which result will be discussed in writing and orally.

Expectations

- 2m85 – recognize that patterning results from repeating an operation (e.g., addition), using a transformation (slide, flip, turn), or making some other change to an attribute (e.g., position, colour);
- 2m90 A – explore multiples in a hundreds chart;
- 2m10 – count by 1’s, 2’s, 5’s, 10’s, and 25’s beyond 100 using multiples of 1, 2, and 5 as starting points;
- 2m8 A • use a calculator to skip count, explore number patterns, and solve problems beyond the required pencil-and-paper skills.
- 2e1 A • communicate ideas (thoughts, feelings, experiences) for specific purposes (e.g., write a paragraph describing a trip to the farm for classmates);

Groupings

Students Working As A Whole Class
Students Working Individually

Teaching / Learning Strategies

Demonstration
Direct Teaching

Assessment

The student’s work on their Hundreds Chart booklet will be marked.

The checklist BLM 6.2 Patterns on the Hundred Chart , can be used to assess how well (Level 1-4) students are able to skip count on the calculator and explore multiples on the hundreds chart.

Anecdotal comments will be recorded regarding their responses in their math journals/ learning logs.

Assessment Strategies

Select Response
Learning Log

Assessment Recording Devices

Checklist
Anecdotal Record

Teaching / Learning

Step 1

Fill in and photocopy *The Hundreds Chart* (BLM 6.1) to create A Hundreds Chart Booklet for each student in your class.

Step 2

Create overhead of The Hundred Chart BLM 6.1.

Step 3

Display hundreds chart on overhead, hand out Hundreds Chart Booklets and calculators.



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Step 4

Instruct students to circle the number 2. Say, "We will count together and circle every second or every other number. Demonstrate this on the overhead."

Step 5

Continue counting out loud as children circle on the hundreds chart (2, 4, 6, 8...)

Step 6

Teacher circulates the room to be sure children have done this properly.

Step 7

When everyone has completed the chart, explain that we will do the same activity but using the calculator.

Step 8

Demonstrate how to type in the calculator a 2 for every circled number on the hundreds chart- 2+2+2....

Step 9

Children continue skip counting on the calculator.

Step 10

Post the discussion questions from the bottom of BLM 6.1 The Hundred Chart. Discuss and model in writing the children's answers to questions a) What pattern do you see? b) Is there anything the same about the circled numbers? c) Write down the last digit (explain what digit means) in each circled number. Is there anything the same about these numbers?

Step 11

Students may continue on their own to complete activities in Hundreds Chart booklet. It is suggested that children complete this activity for the numbers 2, 3, 5, 10.

Step 12





Children complete questions on the bottom of BLM 6.1 The Hundred Chart in their Math Journals.

Adaptations

Children could work in pairs to complete booklet and skip count if they are having difficulty. A calculator with large numbers works well with some students with special needs. The use of a scribe to record the student's response in their learning log and on the hundred chart may be appropriate.

Accommodations for ESL students are provided in subtask 1.





Resources

	Hundreds Chart	subtask_6.cwk
	Patterns on the Hundred Chart	subtask_6.2.cwk
	Quest 2000	Addison- Wesley
	Interactions- Grade 2 Program	Ginn



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	Overhead of BLM 6.1	1
	markers for the overhead	4
	copies of BLM 6.1	multiple
	class set of calculators	1

Notes to Teacher

The teacher could have extra copies of BLM 6.1 The Hundred Chart so students could extend this activity by choosing another number not included in their booklet to complete. Students could also create a title page for their booklet.

Teacher Reflections



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Description

Students will solve problems where a series of numbers have been repeatedly added or subtracted by a fixed amount in order to create a pattern rule. Students will examine the rule, express the rule and continue to apply the rule in order to solve the problems. While working on written activities, the student will communicate appropriately.

Catholic Graduate Expectations:

CGE 2b - reads, understands and uses written materials effectively

Expectations

- 2m82 • identify, extend, and create number, geometric, and measurement patterns, and patterns in their environment;
- 2m83 A • explore patterns and pattern rules;
- 2m87 – identify patterns (e.g., in shapes, sounds);
- 2m89 – identify patterns in addition and subtraction sentences;
- 2m91 – use a calculator and a computer application to explore patterns;
- 2m92 – relate growing and shrinking patterns to addition and subtraction;
- 2m93 – explain a pattern rule;
- 2m94 – given a rule expressed in informal language, extend a pattern;
- 2m21 – investigate the properties of whole numbers (e.g., addition fact families, $3 + 2 = 2 + 3$);
- 2m25 – recall addition and subtraction facts to 18;
- 2m27 – use one fact to find another (e.g., use fact families or adding on);
- 2m28 – mentally add and subtract one-digit numbers;
- 2e1 A • communicate ideas (thoughts, feelings, experiences) for specific purposes (e.g., write a paragraph describing a trip to the farm for classmates);

Groupings

- Students Working As A Whole Class
- Students Working Individually
- Students Working In Pairs

Teaching / Learning Strategies

- Direct Teaching
- Demonstration

Assessment

The teacher can assess students by asking questions while the students are working to determine how well the material is being understood. An anecdotal record of their response can be written down. The math journal/ learning log response can be reviewed.

Using the worksheet the teacher can determine how well the student is able to explore patterns and pattern rules. Their work could be levelled.

Level 4 will have practically no errors

Level 3 will have few minor errors or omissions

Level 2 will have several minor errors and omissions

Level 1 student will have significant errors and omissions

Assessment Strategies

- Questions And Answers (oral)
- Response Journal

Assessment Recording Devices

- Anecdotal Record

Teaching / Learning

Step 1

The teacher shows an example on the board. If you put a number into this mystery machine and a different



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number comes out of the machine, what happened to the number inside the machine?

Step 2

Draw a picture on the board of a machine with numbers going in one tube and coming out another tube, with a square box in the middle as the machine.

Step 3

Add a chart that looks like this-

In	Out
1	2
2	4
3	6
4	8
5	?

Tell the students that the rule is that you double the **In** number to get the **Out** number.

Step 4

Ask the students to discuss this rule. What happened to the first number to get the second? Ask many students to express the rule that each number is added to itself.

Step 5

Ask the students to work with a partner to extend the pattern in their math books to 10. Have many different students explain the extension. Put a different example on the board with the rule involving subtraction and have students work with their partner to solve it. Example: 6-4, 7-5, 9-7, 3-1... The rule is to subtract 2 from the first number to get the second. Have different students explain.

Do as many examples as necessary to understand that the same operation is repeated on the first number to get the second. This is the pattern rule. Ensure that all students understand the concept of a pattern rule before moving on to Step 6.

Step 6

Have students explain their thinking using pictures, words or numbers in their math journal/ learning log. Discuss and model in writing the children's answers.

Step 7

Hand out and explain worksheet- BLM 7.1 Follow My Rule. Fill in as many boxes as you feel necessary to ensure understanding.

Step 8

Teacher circulates and observes student work.

Adaptations

A calculator could be available for those unable to add or subtract.

The use of a scribe to record the student's response in their learning log and on the worksheet may be appropriate.

Students who are having difficulty could work in small groups to complete the BLM.

Accommodations for ESL students can be found in subtask 1.

Resources

**Pattern Play in the Arts****Patterning Algebra & Numeration An Integrated Unit for Grade 2****Guess My Rule**

subtask_7.cwk

**Quest 2000**

Addison-Wesley

**Interactions Grade 2**

Ginn

Notes to Teacher

It is important to have many different students explain their thinking in the group and paired session of this activity. This is a hard concept for some students and different examples of student thinking may be helpful. Note that the same rule may be expressed in many different ways. The students may require many examples of this activity in order to understand.

The activity could be extended by having the students create their own set of in/ out numbers or magic cards on the back of the worksheet.

There are similar questions found in the grade two math programs which could be used as extensions.

Teacher Reflections



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Description

In this activity, students will solve for unknowns in a variety of shape and number patterns. Students will be encouraged to first identify the number or shape rule. They will then discuss different strategies that can be used to solve for unknowns. Students will be encouraged to predict and act out patterns in unknown situations.

As the students work to solve these problems, they are reflecting on the richness of God's creation and the patterns which surround each of us.

Catholic Graduate Expectations:

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.

Expectations

- 2m89 – identify patterns in addition and subtraction sentences;
- 2m86 A – describe and make models of patterns encountered in any context (e.g., wallpaper borders, calendars), and read charts that display the patterns;
- 2m93 A – explain a pattern rule;
- 2m63 A • understand key concepts in transformational geometry using concrete materials and drawings;
- 2m75 – compare and contrast two-dimensional shapes;
- 2m13 A – show counting by 2's, 5's, and 10's to 50 on a number line;
- 2m17 – identify place-value patterns (e.g., trading 10 ones for 1 ten) and use zero as a place holder;
- 2m33 – select and use appropriate strategies (e.g., pencil and paper, calculator, estimation, concrete materials) to solve number problems involving addition and subtraction.

Groupings

- Students Working As A Whole Class
- Students Working Individually

Teaching / Learning Strategies

- Concept Clarification
- Discussion
- Open-ended Questions

Assessment

Learning Log

Describe what makes a pattern a pattern?

Use the *Missing Parts* (BLM 8.1), to evaluate how well the students are able to apply the predict and test method of determining a pattern rule. Look for an understanding that patterning results from repeating an operation, using a transformation, or making some other change to an attribute. You may wish to use the following rating scale to help evaluate the students' work on patterning

Level 4 The student completed *Missing Parts* (BLM 8.1), independently. They applied the concept of patterns and pattern rules with practically no mistakes or omissions. They accurately completed the equations and extended the patterns by modifying what they have learned about pattern rules.

Level 3 The student completed *Missing Parts* (BLM 8.1), independently. They applied the concept of patterns and pattern rules with few minor errors or



Pattern Play in the Arts

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2,4,6,8...

omissions. They accurately completed the equations and extended the patterns by applying what they have learned about pattern rules.

Level 2 The student completed *Missing Parts* (BLM 8.1), with limited assistance. They applied the concept of patterns and pattern rules with several errors and/or omissions. They completed the equations and extended the patterns with limited assistance to reinforce what they know about pattern rules.

Level 1 The student completed *Missing Parts* (BLM 8.1), with assistance. They applied the concept of patterns and pattern rules with major errors and/or omissions. They completed the equations and extended the patterns with assistance to reinforce what they have learned about pattern rules.

Assessment Strategies**Assessment Recording Devices**

Rating Scale

Teaching / Learning**Growing Patterns****Step 1**

Draw a growing pattern on the board. See resource list for additional examples. Ask students to describe the pattern by using words and numbers. Encourage students to be as specific as possible. Record their observations on chart paper.

Name That Rule**Step 2**

Ask students to use the recorded observations to come up with a rule. The rule might be "each time you draw a new shape you add an additional row and an additional column". Encourage students to tell how the numbers change with each new shape. Encourage students to predict what the next shape might look like. Record the shape on the chart paper or the board. Have students test the new shape with the rule. If it doesn't match the rule than continue to predict, test and make alterations until the correct shape is arrived at.

Step 3

Complete the same predict and test activity with the whole group using an equation that contains a rule, e.g. $16 + () = 20$. Have students predict and test. Complete a predict and test activity using a number pattern such as 3, 6, 9, 12, (), (), (), (). Complete as many number patterns and equations as necessary so that students are using their predict and test strategy on their own in an effective way.

Step 4

Have students record in their Learning Logs or Math Journals the strategies they used to help them predict,



Pattern Play in the Arts

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test, and identify pattern rules. Discuss and model in writing the children's answers.

Step 5

Distribute *Missing Parts* (BLM 8.1) and have students complete it individually. When students are finished, collect and mark the BLMs to ensure that students have applied the necessary strategies to identify and extend the patterns.

Adaptations

General accommodations for students with special needs have been suggested in subtask 6. Accommodations for ESL students are found in subtask 1.

Resources



Missing Parts

subtask_8.1.cwk



Quest 2000

Addison-Wesley



Interactions

Ginn Publishing Company

Notes to Teacher

Exploring patterns helps students develop both mathematical competence and an appreciation of the aesthetic beauty of mathematics. Although this Subtask focuses on the mathematical competence of the students, you may provide extensions for students who are done early. Encourage students to draw parallels and make extensions to the world of the arts. Prompt them to think about patterns and equations that can be seen in the world or nature. Ask students where they might see patterns in the natural world (tree rings, geologic formations, animal markings, seasons). You may choose to have students create some art work that depicts these patterns and maybe some equations from the natural world.

Teacher Reflections



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

160 mins

Description

The students will restore the missing parts of three pieces contained in an ancient collection of art. In order to do this, students must first identify the pattern rules and extend the patterns found in each piece. As experts in art restoration, students will also be required to create and to add some of their own patterns to each piece so that they can make the finished product as beautiful as possible. The students will complete their restorations individually. They will record their finished pieces on three separate blackline masters. After students have completed and recorded their restorations, they will share their finished products with the other students in the form of a multimedia celebration which will include a dance, a piece of visual art, and a piece of music. With these pieces, we seek to appreciate the many aspects of the gift of creativity. Students will look at the obvious as well as the hidden patterns in the creative work they do.

Catholic Graduate Expectations:

CGE 2c - presents information and ideas clearly and honestly and with sensitivity to others.

CGE 5d - finds meaning, dignity, fulfilment and vocation in work which contributes to the common good.

Expectations

- 2m33 – select and use appropriate strategies (e.g., pencil and paper, calculator, estimation, concrete materials) to solve number problems involving addition and subtraction.
- 2m2 A • compare and order whole numbers using concrete materials, drawings, numerals, and number words to develop an understanding of place value;
- 2m87 – identify patterns (e.g., in shapes, sounds);
- 2m88 – combine two attributes in creating a pattern (e.g., size and position);
- 2m93 – explain a pattern rule;
- 2m94 A – given a rule expressed in informal language, extend a pattern;
- 2m95 – transfer patterns from one medium to another (e.g., actions, words, symbols, pictures, objects, calculator).
- 2a48 A • create short dance pieces, using techniques learned in this grade;
- 2a49 • communicate understanding of works in drama and dance through discussion, writing, movement, and visual art work;
- 2a1 A • demonstrate an understanding of the basic elements of music specified for this grade (see below) through listening to, performing, and creating music;
- 2a7 A – identify rhythmic patterns (e.g., clap the pattern of syllables in nursery rhymes);

Groupings

- Students Working Individually
- Students Working As A Whole Class
- Students Working In Pairs

Teaching / Learning Strategies

- Brainstorming
- Improvisation
- Demonstration

Assessment

The teacher will view the students as they develop their performance tasks. Anecdotal reports of the student's progress can be made.

Assessment Strategies

- Observation
- Performance Task

Assessment Recording Devices

- Anecdotal Record

Teaching / Learning

Part A

Planning: Reintroduction of the Culminating Project

Step 1

The Museum of Patterning has hired you to do some restoration work on their patterning exhibition. Your task



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

is to restore the exhibition to its original beauty. You must be especially careful to maintain the patterns contained in each art form. This exhibition contains four-count measures of music, a numeral design and a dance. Each of these pieces needs the work of a professional to help restore the damaged and missing parts.

Step 2

Have students refer to BLM 2.1, BLM 2.2, BLM 2.3, and BLM 2.4 which they completed in Subtask 2. Have students discuss with a partner their thoughts on patterning. Have students add to their sheets and revise their plan to incorporate new ideas they have discussed.

Step 3

Remind students about the notes which they looked at in Subtask 3. Review the beat value of a whole, quarter, eighth and half note. Reproduce any four-count measure on an overhead using notes and display for the class to see. Ask the students to count the beats, and name the notes in each measure. Ask for a volunteer to clap the beat. Encourage the students to say 'walk', 'walk', 'walk', 'walk' in an example with 4 quarter notes. Have the class repeat by clapping the measure. After sufficient practice with 4 quarter notes, add a new four beat measure such as two half notes. Ask the students how many beats there are in the measure, to name the notes and ask a volunteer to clap out the measure. Encourage the students to clap, bounce, clap, bounce and say "jo-og" "jo-og" to help with the timing. Have the class repeat. Continue displaying four-count measures on the overhead and questioning the students about the name of the notes, their value and to clap the rhythms. Be sure to review that the quarter note has one beat (1 clap), the eighth note has one beat (2 quick claps) the half has two beats (1 clap, 1 bounce) and the whole note has four beats (1 clap, 3 bounces). Have them check that each time there are four beats to a measure.

Part B

Restoration of the Pieces

Step 1- Restoring the Visual Design Pattern

Distribute *Restoration of Visual Pattern* (BLM 9.1) to each student. Read the instructions regarding the proper restoration of this numerical design. Students must fill in any missing blanks (numbers) in the design and obey any pattern rules which they identify. They must show two new counting patterns and identify one with colour and the other by outlining the number with a symbol such as square, diamond or a flower. Students who are done early can mount their finished pieces on colour construction paper.

Step 2- Creating the Musical Interpretation

Distribute *Restoration of Music* (BLM 9.2) to each student. Inform students that they are now beginning the first phase of the restoration work. Read the instructions together in order to review the names and values of each note. Remind students that they must continue any patterns they see in the music. Students must also remember to check that each measure or line of music adds up to four beats. Remind students about the fractions and addition sentences you used in Subtask 3. Students who are done can choose an instrument which they will use to perform their piece in subtask 10 and practice tapping out their music.

Step 3- Creating Interpretative Movement- The Dance

In large group, the teacher displays a pattern which is student produced or teacher created such as circle, square, diamond... The class together will extend the pattern and brainstorm movements which could correspond to the pattern. Encourage students to be creative with their movements suggestions. List these on the board or on chart paper. Examples may include: head roll, arm swings, stomp, jump, turn, step, crouch, bend, reach, shoulder rolls. Ask students to think of ways to join movements in order to represent the example displayed in the class list of possible movements. Have volunteers perform their pattern dance. This dance might be jog, jog, jog, jog, bend, crouch, bend, crouch, jog, jog, jog, jog... The movements do not need to be identical each time you do them e.g. if you bend forward the first time you do your bend, crouch, bend, crouch sequence then you might bend backward the second time you do this sequence. Remind



Pattern Play in the Arts









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students to check that the dance pattern obeys any pattern rules they can identify. Distribute *Restoration of Dance* (BLM 9.3) and review with the students. Instruct students to work individually in an open space (gym, library or performing arts room) to restore their individual dance. Be sure they fill in the spaces on the damaged dance pattern sheet and practice and adjust as needed. Students can refer to the list of possible movements in order to complete the dance.

Adaptations

Refer to subtask 1 and subtask 6 for general accommodations for special needs students, including ESL students.

Resources

-  **Culminating Task- Museum of Patterning**
-  **Restoration of a Visual Pattern** subtask_9.cwk
-  **Restoration of Music** subtask_9.2.cwk
-  **Restoration of Dance** subtask_9.3.cwk
-  **Interactions Grade Two** Ginn Publishing
-  **musical instruments** 1
-  **large open space** open area within the school
-  **Blackline Masters completed in Subtask 2**

Notes to Teacher

The students must complete BLM 9.1, BLM 9.2, and BLM 9.3 because they will use these in their presentation in subtask 10.

Teacher Reflections



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

200 mins

Description

The students will come together to present their restored pieces to the Museum of Patterning. The students will celebrate the work of one another and all human hands and nurture the attitude of wonder and awe for the fruit's of God's creation. Each student will present all three parts of their entry stressing God's role as creator, and focusing on the many gifts which are a part of each student. The peers will help reproduce the music and dance sections after each student has presented. Students celebrate their gifts from God which allow them to observe and create patterns in the beautiful world around them. Art critics may be invited to join in the celebration.

Catholic Graduate Expectations:

CGE 5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

CGE 2e - uses and integrates the Catholic faith tradition, in the critical analysis of the arts, media, technology and information systems to enhance the quality of life.

CGE 5c - develops one's God-given potential and makes a meaningful contribution to society.

CGE 2c - presents information and ideas clearly and honestly and with sensitivity to others.

Expectations

- 2a5 • communicate their response to music in ways appropriate for this grade (e.g., through visual arts, drama, creative movement, language).
- 2a28 • produce two- and three-dimensional works of art that communicate ideas (thoughts, feelings, experiences) for specific purposes and to familiar audiences;
- 2a48 A • create short dance pieces, using techniques learned in this grade;
- 2a60 – demonstrate the ability to move and control their bodies in space and time (e.g., by creating tableaux in small groups);
- 2a63 – interpret songs, music, poetry, or images, using elements of movement (e.g., rhythm, space).
- 2a7 – identify rhythmic patterns (e.g., clap the pattern of syllables in nursery rhymes);
- 2a15 A – create rhythmic and melodic patterns (e.g., ostinati), using a variety of sounds (e.g., vocal and instrumental sounds);
- 2a16 – create simple patterned movement to familiar music, using their knowledge of beat and rhythm;
- 2a21 – create short songs and instrumental pieces, using a variety of sound sources;

Groupings

Students Working As A Whole Class

Teaching / Learning Strategies

Demonstration

Assessment

The teacher observes and records how well each part of the performance task is presented on the checklist, looking for the extension of the pattern in each media form. The teacher collects BLM 9.1, BLM 9.2, and BLM 9.3, and uses these as a reference to make anecdotal comments on the extension of the pattern and completion of the work.

Assessment Strategies

Observation
Performance Task

Assessment Recording Devices

Checklist
Anecdotal Record

Teaching / Learning

The teacher finds or creates appropriate and comfortable space for the presentation of the entries. Students sit in a circle with space left for the presenter.



Pattern Play in the Arts

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Greeting

Leader: The Lord be with you

All: And also with you

Leader: Today we gather to celebrate the special gifts God has given to each one of us. Let us join together to sing *Song of the Earth*.

Opening Song

Song of the Earth, #10, We Belong to the Lord Jesus

Opening Prayer

Leader: Lord, you have created us equal and yet so very different. Let us celebrate our individual talents as we listen to God's word.

Word of God

Luke 24.30

Leader: God is the ultimate creator. The students will now take on the role of creators by using their own creative powers to share the pieces of art which they have completed.

Sharing Our Gifts

Students are asked to present in order:

- The musical interpretation performed with their choice of instrument. Their peers are asked to join in as they understand the pattern. Each students could perform using their instruments or by tapping or clapping.
- The visual presentation is displayed to the group.
- The dance interpretation is performed. Peers should join in with the presenter after sufficient repetition. Ensure students are able to perform the entire music piece or dance before their peers join in.

Giving Thanks

Students clap and celebrate their success as art restorers and as children of God the ultimate creator.

Invite the children one at a time to give thanks to God by praising God for a gift which allowed them to create and present their pieces.

They begin by saying, "I praise God for _____."

All respond "Thank you God."

Repeat for each student.

Closing Song

Lord of the Dance, Born of the Spirit

Grace should be said if there are any refreshments being offered.

Adaptations

This presentation would have to be adapted to meet the needs of individual students. Those unable to present their work could have someone else interpret it for them. Additional accommodations have been suggested in subtasks 1 and 6.







Resources



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

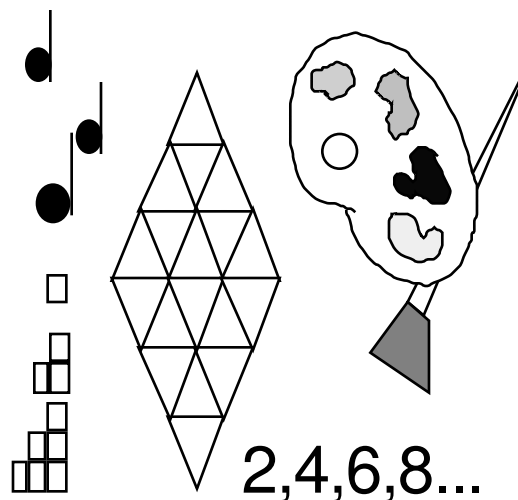
200 mins

-  **An Artistic Presentation** subtask_10.cwk
-  **We belong to the Lord Jesus** CCCB
-  **Music-We belong to the Lord Jesus-
Grade Two** Publication Service- CCCB
-  **musical instruments** 1
-  **large open space**
-  **Blackline Masters completed in Subtask 9**

Notes to Teacher

The use of a gym or library may afford more space for the presentation. 'Art critics' from all over the school or from home may be invited to share in the celebration. Refreshments may add to the celebration.

Teacher Reflections



Appendices

Pattern Play in the Arts

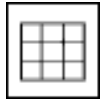
Patterning Algebra & Numeration

Resource List:
Black Line Masters:
Rubrics:
Unit Expectation List and Expectation Summary:



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2



Rubric

- Culminating Task- Museum of Patterning** ST 9
3
- Name Logo** ST 5
3
Students are to create a logo surrounding their name which has a repeating pattern and colour.
- Sequential Patterns in Dance** ST 4
2
for use with subtask 4 ~ Patterns in Movement and Dance



Blackline Master / File

- An Artistic Presentation** ST 10
subtask_10.cwk
- Dance Pattern** ST 2
subtask_2.4.cwk
- Eighth Note** ST 3
subtask_3.2.cwk
- Favourite Numbers/Random Numbers** ST 1
subtask_1.cwk
- Guess My Rule** ST 7
subtask_7.cwk
Students work to solve number problems involving adding or subtracting.
- Half Note** ST 3
subtask_3.3.cwk
- Hundreds Chart** ST 6
subtask_6.cwk
- Missing Parts** ST 8
subtask_8.1.cwk
A blackline master containing number equations, skip counting, and shape patterns. Students need to identify the pattern rule in order to complete the equation and patterns.
- Musical Pattern** ST 2
subtask_2.3.cwk
- Note Value** ST 3
subtask_3.5.cwk
- Pattern Boxes** ST 2
subtask_2.1.cwk
- Patterns on the Hundred Chart** ST 6
subtask_6.2.cwk
- Quarter Note** ST 3
subtask_3.1.cwk
- Restoration of a Visual Pattern** ST 9
subtask_9.cwk

- Restoration of Dance** ST 9
subtask_9.3.cwk
- Restoration of Music** ST 9
subtask_9.2.cwk
- Visual Pattern** ST 2
subtask_2.2.cwk
- Whole Note** ST 3
subtask_3.4.cwk






Print

- 150 Folk Songs to Sing, Read and Play** ST 3
Kodaly Musical Training Institute
- Interactions** Unit
Ginn
Grade two
- Interactions** ST 8
Ginn Publishing Company
ISBN 0-77023-750-9
Grade 2 Mathematics Program
1998 Edition 1
- Interactions Grade 2** ST 7
Ginn
ISBN 0-77023-750-9
1998 Edition 1
- Interactions- Grade 2 Program** ST 6
Ginn
ISBN 0-77023-750-9
Grade two math program
1998 Edition 1
- Interactions Grade Two** ST 2
Ginn Publishing
- Interactions Grade Two** ST 3
Ginn Publishing
- Interactions Grade Two** ST 4
Ginn Publishing
- Interactions Grade Two** ST 9
Ginn Publishing
- Interactions Grade Two Program** ST 1
Ginn Publishing
ISBN 0-77023-750-9
Unit 5 Investigating Music, Art, and Dance
Edition 1, 1998
- Picasso and the Cubists** ST 2
McCall Publishing Company
- Practical Patchwork and Applique Techniques** ST 2
G. Lawther
- Quest 2000** Unit
Addison Wesley
Grade two



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

- | | |
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| <p><input type="checkbox"/> Quest 2000
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Exploring mathematics grade two
1998 Edition</p> <p><input type="checkbox"/> Quest 2000
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The Kodaly Musical Training Institute</p> <p><input type="checkbox"/> The Kodaly Method
Lois Choksy</p> <p><input type="checkbox"/> Visiting the Art Museum
L.K. Brown and M. Brown
contains examples of modern painting and graphic design</p> <p><input type="checkbox"/> We belong to the Lord Jesus
CCCB
Publication Service, CCCB, 0-88997-317-2
Religion Document- Year 2</p> | <p>ST 6  Media</p> <hr/> <p>ST 7 <input type="checkbox"/> Music-We belong to the Lord Jesus- Grade Two ST 10
Publication Service- CCCB</p> <p>ST 8  Website</p> <hr/> <p><input type="checkbox"/> Essentials of Music ST 4
http://www.essentialsofmusic.com
Alphabetical listing of classical composers with samples of music and stores where it is available for purchase.</p> <p>ST 2</p> <p>ST 3  Material</p> <hr/> <p>ST 1 <input type="checkbox"/> coloured pencils and markers Unit</p> <p><input type="checkbox"/> coloured pencils, markers, crayons or pastels ST 5
per class</p> <p>ST 2 <input type="checkbox"/> copies of BLM 6.1 ST 6
multiple
per class</p> <p>ST 2 <input type="checkbox"/> large white art paper ST 5
1
per person</p> <p>ST 2 <input type="checkbox"/> markers for the overhead ST 6
4
per class</p> <p>ST 2 <input type="checkbox"/> Overhead of BLM 6.1 ST 6
1
per class</p> <p>ST 10 <input type="checkbox"/> pattern blocks Unit
per person</p> |
|--|--|



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2



Equipment / Manipulative

- calculators** Unit
per person
- CD player or stereo with cassette player** ST 4
per class
CD's or tapes of classical music to play in the stereo are necessary
- class set of calculators** ST 6
1
per person
- fraction circles** ST 3
1
per person
Cuisenaire rods can also be used
- large open space for students to work in groups** ST 4
per class
the school's gym or performing arts room would work well
- modelling clay** ST 3
per group
a variety of colours
- musical instruments** ST 9
1
per person
A variety of instruments can be used here including homemade shakers or commercially bought instruments.
- musical instruments** ST 10
1
per person
A variety of instruments are needed. They could be homemade shakers or commercially bought instruments.
- pattern blocks** ST 5
1 bucket
per group
- primary metric rulers** Unit
per person
primary metric



Other

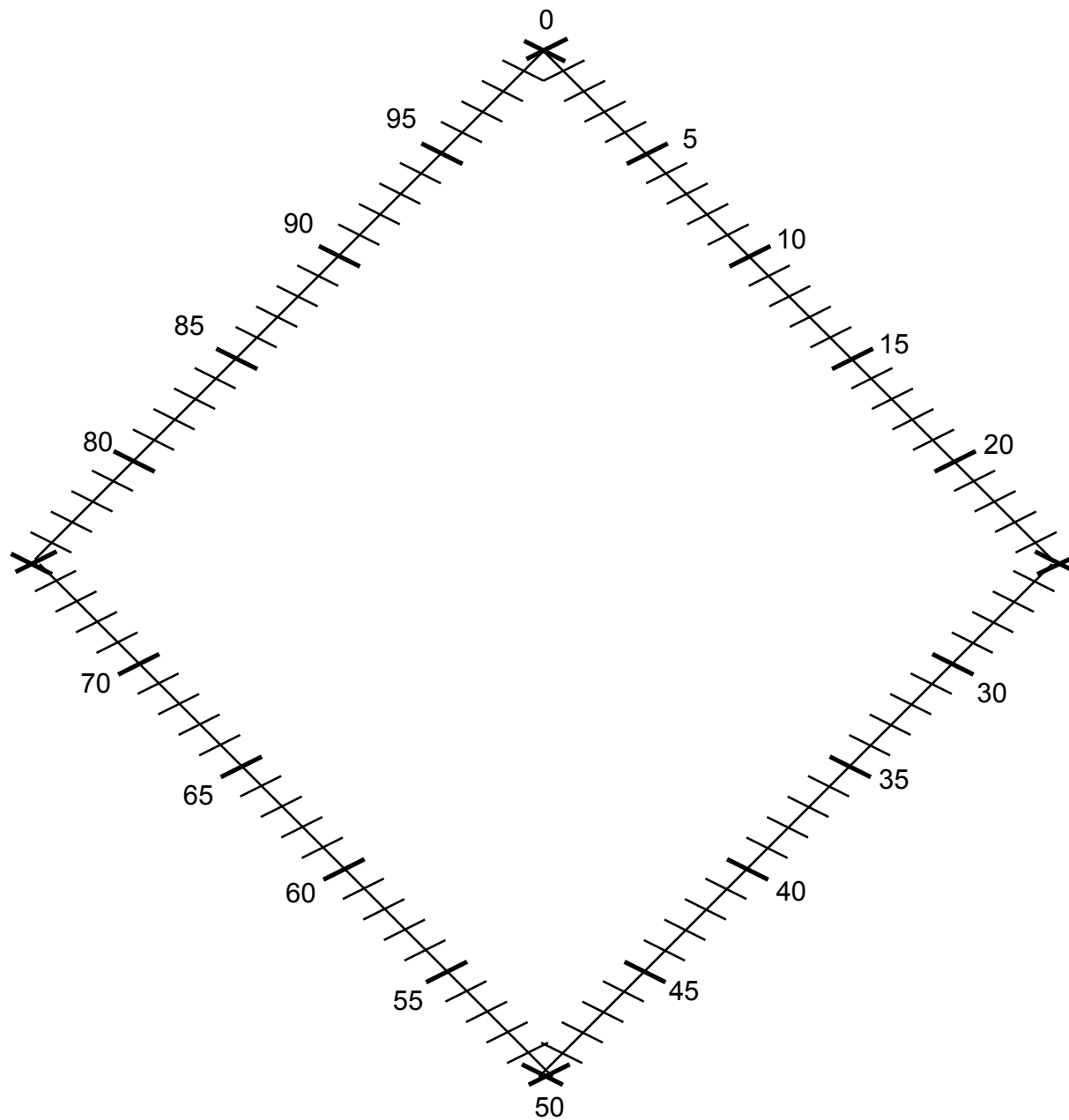
- Blackline Masters completed in Subtask 2** ST 9
Students need to use and refer to blackline masters created in subtask 2
- Blackline Masters completed in Subtask 9** ST 10
The students will use the blackline masters completed in subtask 9 to present their performance tasks.
- large open space** ST 9
open area within the school
a large space which is necessary for students to develop their dance piece
- large open space** ST 10
A large open space is required to present the performance tasks.

Favourite Numbers

Choose forty (40) of your favourite numbers and circle them.

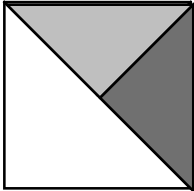
zero one two three four five six seven eight
nine ten eleven twelve thirteen fourteen
fifteen sixteen seventeen eighteen nineteen
twenty 21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40 41
42 43 44 45 46 47 48 49 50 51
52 53 54 55 56 57 58 59 60 61
62 63 64 65 66 67 68 69 70 71
72 73 74 75 76 77 78 79 80 81 82
83 84 85 86 87 88 89 90 91 92 93
94 95 96 97 98 99 100

Random Numbers



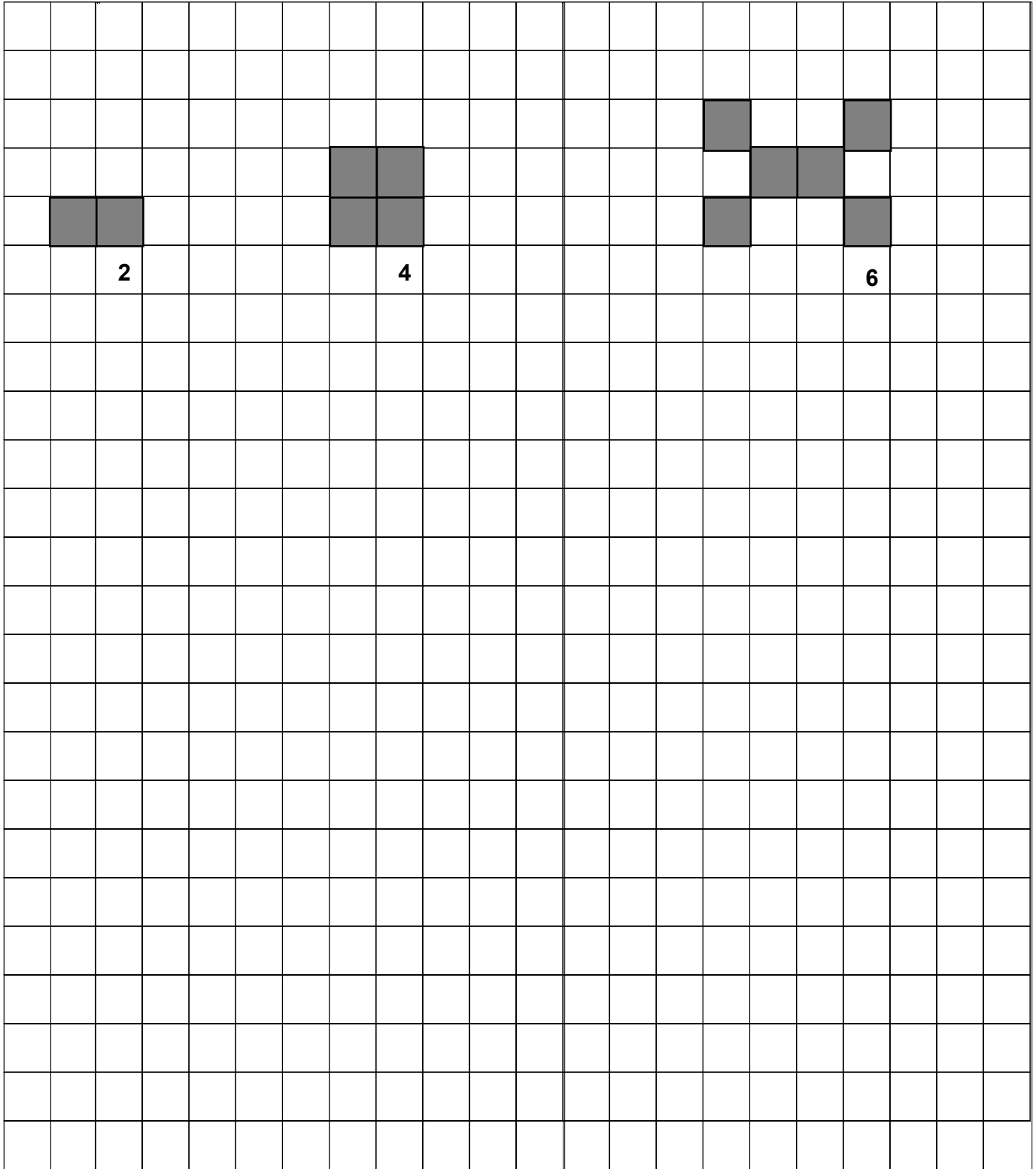
Pattern Boxes

Fill in each square in the grid with a pattern like this:
Use three colours.



Restore the Visual Patterns

Use colour, shapes and numbers to complete the pattern design this artist began. Remember to be creative!



Restoration of a Dance

Restore the dance pattern this choreographer began. Be creative and try your dance out to see how it looks. Remember that each dance step has to lead into the next dance step. Use symbols, words and or pictures to record your steps. Practise your dance.

Step 1 right foot one step forward

Step 2 left foot one step forward

Step 3 right foot _____

Step 4 left foot _____

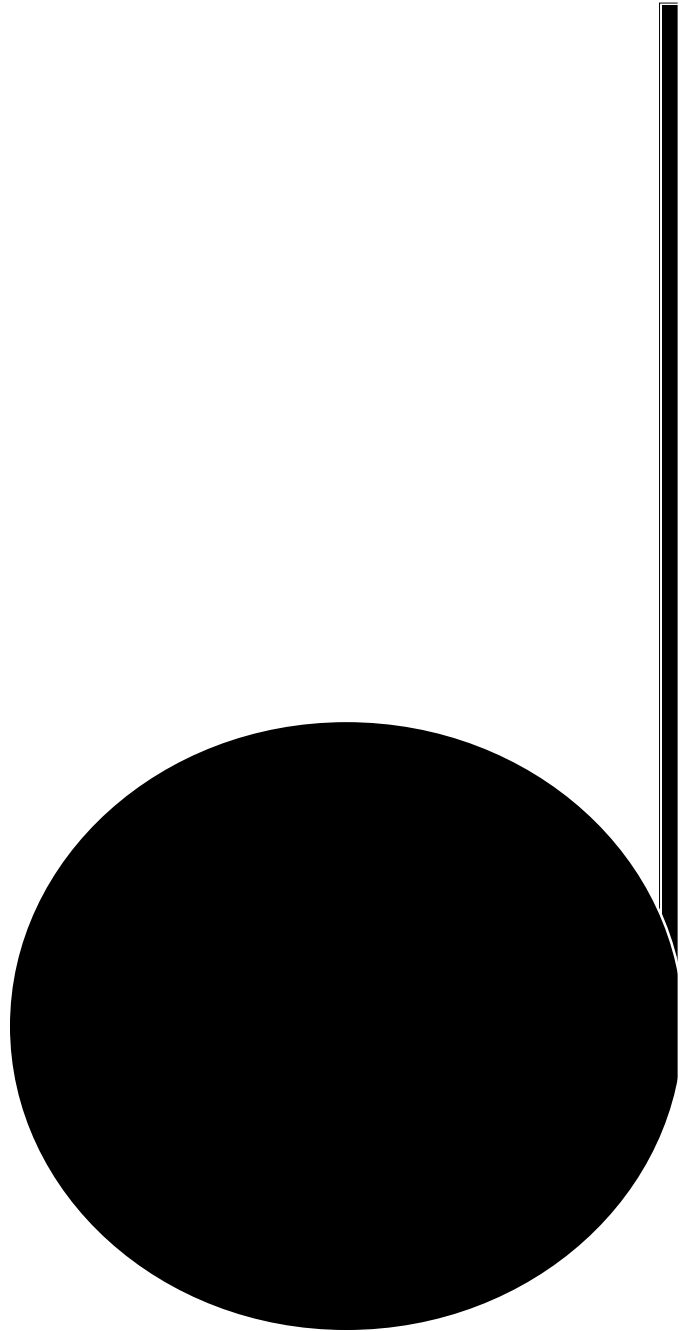
Step 5 right foot _____

Step 6 left foot _____

Step 7 right foot _____

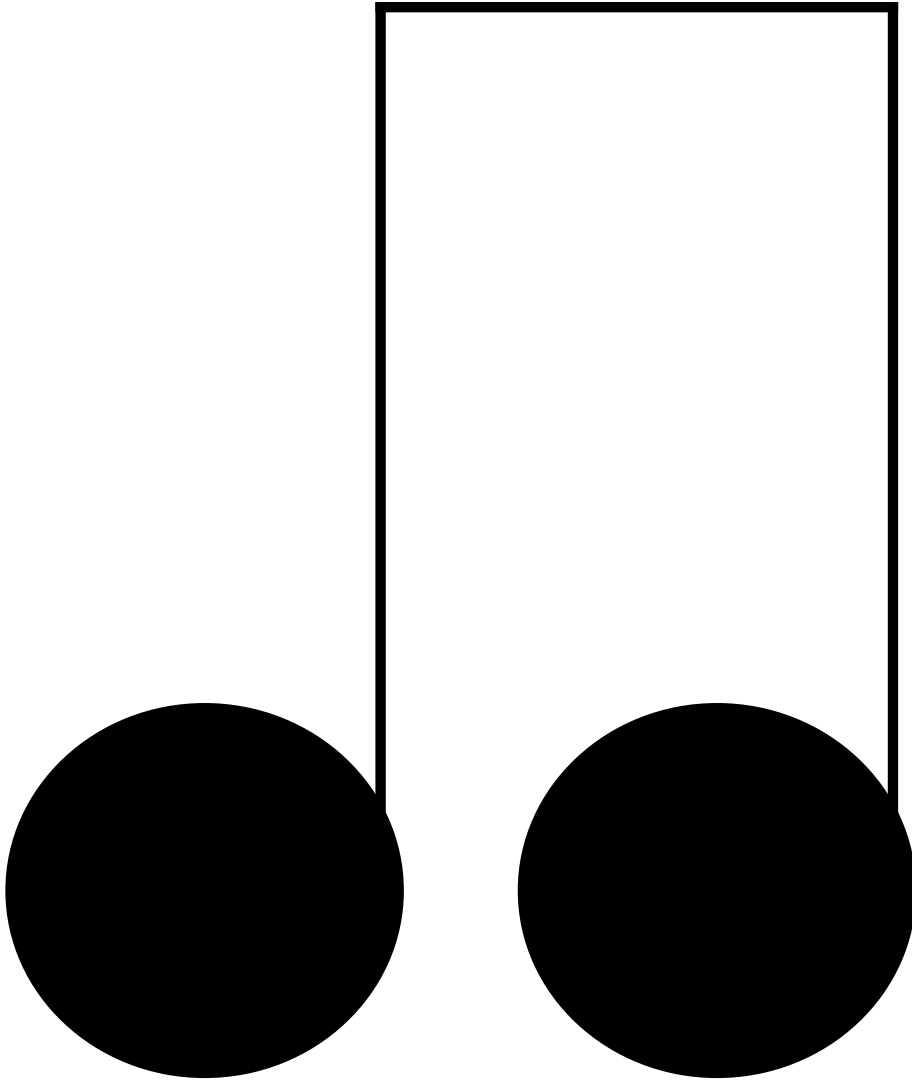
Step 8 left foot _____

Quarter Note



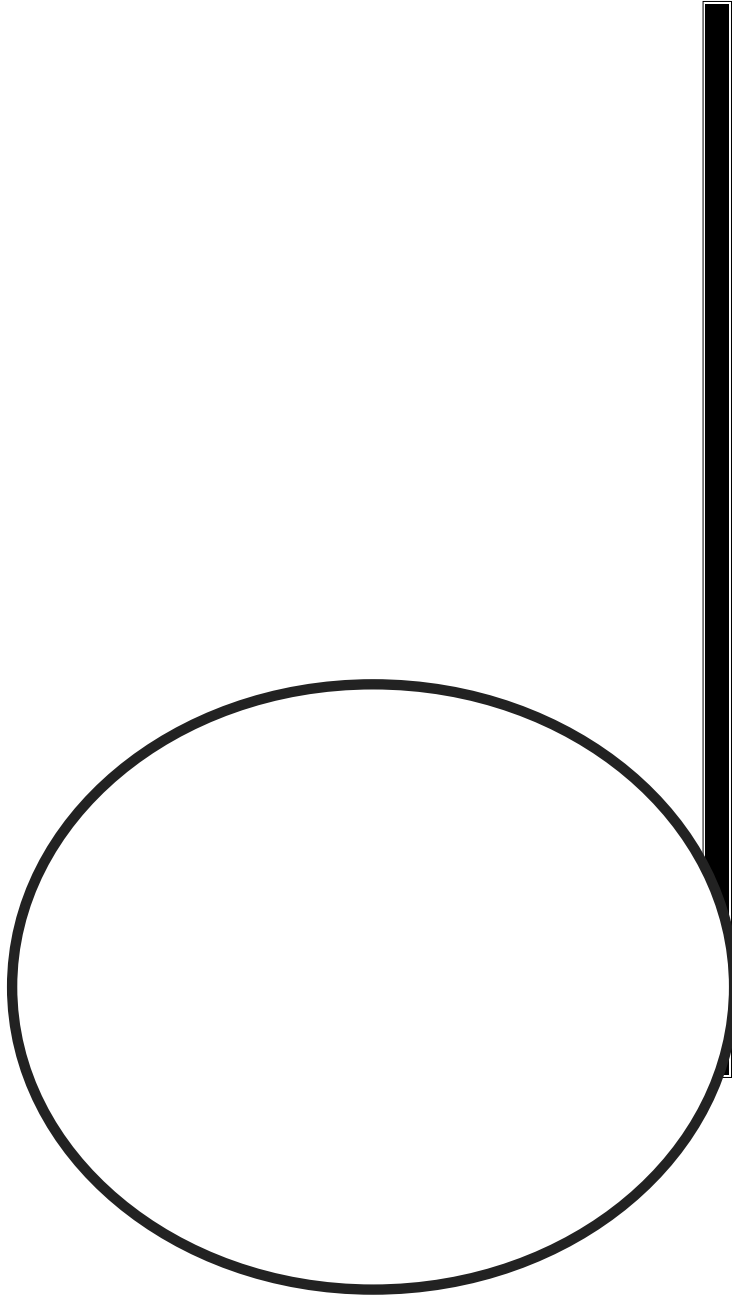
“Walk”

Eighth Notes



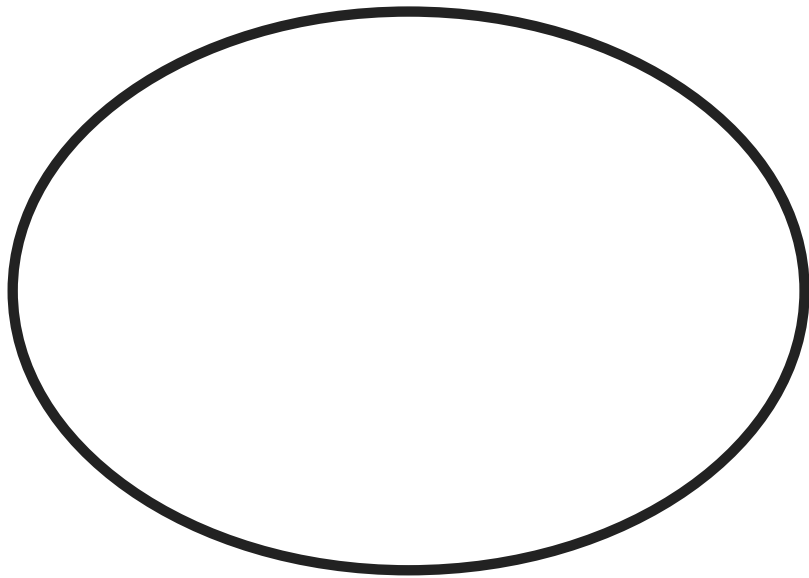
“running”

Half Note



“jo-og”

Whole Note



“jogging slowly”

Note Value

Remember: A quarter note equals one clap. You can say the word “walk”.
Two eighth notes joined together equals two quick claps . Say “running”.
A half note equals a clap and a bounce. You can say “jo-og”.
A whole note equals a clap and 3 bounces. You can say “jogging slowly”.

Quarter note = 1 slow count or 1 clap
Two eighth notes = 2 quick counts or 2 quick claps
Half note = 2 slow counts or 1clap and 1 bounce
Whole note = 4 counts or 1 clap and 3 bounces

Clap the following 4-count measures.

1.



2.



3.



4.



Complete the following 4-count measures by adding your own notes.

1.



Create your own 4-count measures below.

1.

2.

The Hundreds Chart

Pattern Play in the Arts

Subtask 6

BLM 6.1

On the Hundreds chart circle the _____ and circle every _____ number.

Keep going.

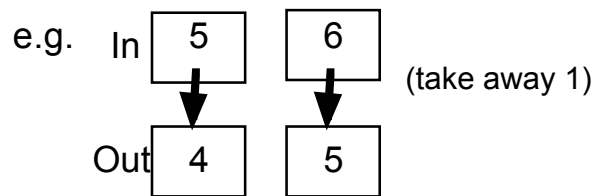
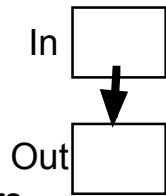
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Answer these questions in your math journal/ learning log:

1. What pattern do you see?
2. What is the same about the circled numbers?
3. Write down the last digit in each circled number.
Do you see a pattern?

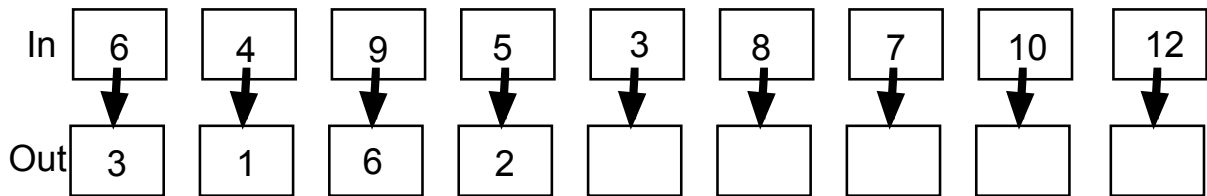
Follow My Rule

Here is a set of magic cards. They go in the machine as 1 number and come out as another. What happens to the cards?

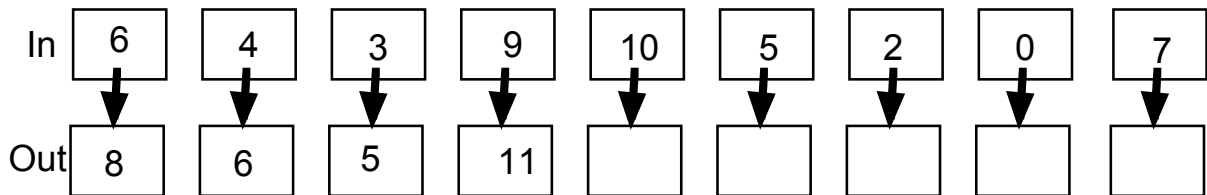


Fill in the missing numbers.

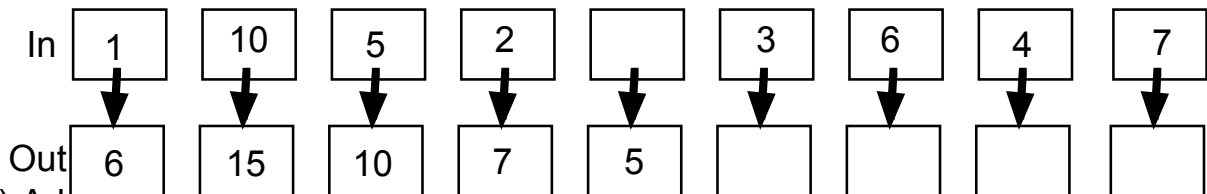
1.) Take away 3



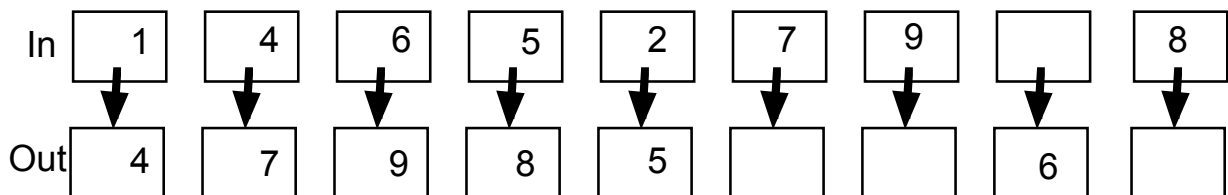
2.) Add 2



3.) Add 5



4.) Add 3



Missing Parts

Find out what the missing part is in each equation. Fill in the empty box with the correct number. e.g $5 + \boxed{5} = 10$

1. $16 + \boxed{} = 20$

6. $7 + 9 = \boxed{}$

2. $\boxed{} + 9 = 18$

7. $20 - \boxed{} = 10$

3. $\boxed{} - 6 = 14$

8. $3 + \boxed{} = 18$

4. $15 - 5 = \boxed{}$

9. $\boxed{} - 5 = 30$

5. $7 + \boxed{} = 13$

10. $25 + \boxed{} = 50$

Try This:

$\boxed{} + \boxed{} = 5$

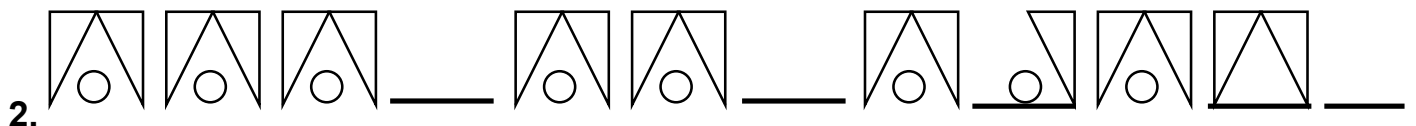
How many different numbers can you use to make the equation?

Continue each counting pattern. Use a hundreds chart to help you if you like.

1. 100, 110, 120, _____, _____, _____, _____, _____, _____, _____, _____
2. 128, 138, 148, _____, _____, _____, _____, _____, _____, _____, _____
3. 115, 120, 125, _____, _____, _____, _____, _____, _____, _____, _____
4. 95, 100, 105, _____, _____, _____, _____, _____, _____, _____, _____
5. 184, 186, 188, _____, _____, _____, _____, _____, _____, _____, _____
6. 140, 142, 144, _____, _____, _____, _____, _____, _____, _____, _____
7. 78, 76, 74, 72, _____, _____, _____, _____, _____, _____, _____, _____

Complete the pattern by adding the missing shape or shapes.

1.



Restoration of Visual Pattern

Pattern Play in the Arts
Subtask 9
BLM 9.1

Fill in the missing numbers to complete this counting pattern.

Colour squares to show a different pattern with the numbers.

Use a symbol such as a diamond or flower to show a third number pattern

101	102	103	104	105			108		110
111	112	113			116			119	
121	122	123			126		128		130
			134			137		139	
141				145	146			149	
				155			158		160
			164			167			
	172	173							180
		183							190
191						197	198	199	200

Tell what pattern you see.

Restoration of Music

Please restore this musical piece by filling in the missing notes in the 4 beat measures. Remember to look for a pattern.

Note: Lines 1 and 2 are still intact as they contain 4 beats.

quarter note ● = 1 beat "walk" (1 clap)

eighth note ● | ● = 1 beat "running" (2 quick claps)

half note ○ = 2 beats "jo- og" (1 clap, 1 bounce)

whole note ○ = 4 beats "jogging slowly " (1 clap, 3 bounces)

Line 1	● ● ● ●	=4 beats
Line 2	○	=4 beats
Line 3	● ● _____	=4 beats
Line 4	● _____	=4 beats
Line 5	○ _____	=4 beats
Line 6	● ● _____	=4beats
Line 7	_____	=4 beats
Line 8	_____	=4 beats
Line 9	_____	=4 beats
Line 10	_____	=4 beats

Practise clapping or tapping your music.

Restoration of Dance

Please restore this dance piece by filling in the missing movements. Refer to the class list of possible movements and sequencing exercises from Subtask 4. The pattern must repeat at least once.

Be creative! The movements do not have to be identical each time you repeat them e.g. the shoulder rolls may be forward the first time you do them and backward the second time you do them.

jog	jog	_____	_____
shoulder rolls	reach	_____	_____
bend	_____	_____	crouch
crouch	crouch	_____	_____
_____	_____	turn	step

jog	jog	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	turn	step

Sequential Patterns in Dance
for use with Subtask 4 : Patterns in Movement and Dance
 from the Grade 2 Unit: **Pattern Play in the Arts**



Student Name: _____
 Date: _____

Expectations for this Subtask to Assess with this Rubric:

- 2m94** – given a rule expressed in informal language, extend a pattern;
- 2m95** – transfer patterns from one medium to another (e.g., actions, words, symbols, pictures, objects, calculator).
- 2a48** • create short dance pieces, using techniques learned in this grade;
- 2a50** • solve problems in various situations through role playing and movement in drama and dance.

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Communication - transfer patterns from one medium to another	– is able to explain and teach their movement to the group – unclearly and imprecisely – rarely using appropriate patterning terminology	– is able to explain and teach their movement to the group with some clarity and some precision, using some patterning terms	– is able to explain and teach their movement to the group – clearly and precisely uses clear and precise patterning terms	– is able to explain and teach their movement to the group clearly, precisely, and confidently – always using appropriate patterning terminology
Problem Solving - given a rule expressed in informal language, extend a pattern, solves problems in various situations	– works co-operatively in their group – with a limited range of appropriate strategies – with limited accuracy	– works co-operatively in their group – with appropriate strategies – frequently accurately	– works co-operatively in their group – by choosing the most appropriate strategies – usually accurately	– works co-operatively in their group – by modifying known strategies or creating new strategies
Performance and creative work - create short dance peices	– applies few of the movement skills, concepts, and techniques taught – performs and creates only in limited and incomplete ways	– applies some of the movement skills, concepts, and techniques taught – occasionally performs and creates in complete ways	– applies most of the movement skills, concepts, and techniques taught – usually performs and creates in complete ways	– applies all (or almost all) of the movement skills, concepts, and techniques taught – performs and creates in well-developed ways
Critical analysis and appreciation - express their response to music	– demonstrates limited attention as an audience member while other groups perform their sequences	– demonstrates some attention as an audience member while other groups perform their sequences	– is an attentive audience member while other groups perform their sequences	– the student is an attentive audience member while other groups perform their sequences

Student Name: _____
 Date: _____

Name Logo
 for use with Subtask 5 : Visual Art- Name Logo
 from the Grade 2 Unit: Pattern Play in the Arts



Expectations for this Subtask to Assess with this Rubric:

- 2m82** • identify, extend, and create number, geometric, and measurement patterns, and patterns in their environment;
- 2m93** – explain a pattern rule;
- 2m95** – transfer patterns from one medium to another (e.g., actions, words, symbols, pictures, objects, calculator).

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Communication - explain a pattern rule	<ul style="list-style-type: none"> – unclearly and imprecisely – rarely using appropriate mathematical terminology – cannot explain pattern rule 	<ul style="list-style-type: none"> – with some clarity and some precision – sometimes using appropriate mathematical terminology and symbols – tries to explain pattern rule 	<ul style="list-style-type: none"> – clearly and precisely – usually using appropriate mathematical terminology and symbols – explains pattern rule 	<ul style="list-style-type: none"> – clearly, precisely, and confidently – always uses appropriate mathematical terminology and symbols – clearly explains pattern rule
Understanding of concepts - transfer of patterns	<ul style="list-style-type: none"> – by giving partially complete but inappropriate explanations – using only a few of the required concepts- not transferring from one medium to another 	<ul style="list-style-type: none"> – by giving appropriate but incomplete explanations – using more than half of the required concepts- transfers most of the pattern from one medium to another 	<ul style="list-style-type: none"> – by giving both appropriate and complete explanations – using most of the required concepts, transfers pattern from one medium to another 	<ul style="list-style-type: none"> – by giving both appropriate and complete explanations, and by showing that he or she can apply the concepts in a variety of contexts – using all of the required concepts- transfer patterns from one medium to another
Application of mathematical procedures- extend and create patterns	<ul style="list-style-type: none"> – that are considered to be basic in solving problems – with many errors and/or omissions – color and pattern exist but are not matched 	<ul style="list-style-type: none"> – that are considered to be appropriate in solving problems – with several minor errors and/or omissions- - pattern and colour exist but are not matched 	<ul style="list-style-type: none"> – that are considered to be the most appropriate in solving problems – with a few minor errors and/or omissions - colour and symbol are patterned 	<ul style="list-style-type: none"> – that are considered to be the most appropriate in solving problems, and justifies the choice – with practically no minor errors and/or omissions- colour and symbol are patterned consistently

Culminating Task- Museum of Patterning
for use with Subtask 9 : Museum of Patterning~Culminating Task
 from the Grade 2 Unit: **Pattern Play in the Arts**



Student Name: _____
 Date: _____

Expectations for this Subtask to Assess with this Rubric:

- 2m2** • compare and order whole numbers using concrete materials, drawings, numerals, and number words to develop an understanding of place value;
- 2m94** – given a rule expressed in informal language, extend a pattern;
- 2a1** • demonstrate an understanding of the basic elements of music specified for this grade (see below) through listening to, performing, and creating music;
- 2a7** – identify rhythmic patterns (e.g., clap the pattern of syllables in nursery rhymes);
- 2a48** • create short dance pieces, using techniques learned in this grade;

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Application -numeration and patterning procedures	<ul style="list-style-type: none"> – identifies and extends patterns with assistance – uses patterning procedures that are considered to be basic in solving problems – orders numbers with significant errors and/or omissions 	<ul style="list-style-type: none"> – identifies and extends patterns with limited assistance – uses patterning procedures that are considered to be appropriate in solving problems – orders numbers with several minor errors 	<ul style="list-style-type: none"> – identifies and extends patterns independently – uses patterning procedures that are considered to be the most appropriate in solving problems – orders numbers with a few minor errors and/or omissions 	<ul style="list-style-type: none"> – identifies and extends patterns independently – uses patterning procedures that are considered to be the most appropriate in solving problems, and justifies the choice – orders numbers with practically no minor errors
Communication - Performance and creative work in restoration pieces	<ul style="list-style-type: none"> – applies few dance/ music skills, concepts, and techniques taught – performs and creates only in limited and incomplete ways – uses materials, and instruments correctly 	<ul style="list-style-type: none"> – applies some of the dance/ music skills, concepts, and techniques taught – occasionally performs and creates in complete ways – uses materials, and instruments correctly 	<ul style="list-style-type: none"> – applies most of the dance/ music skills, concepts, and techniques taught – usually performs and creates in complete ways – uses materials, and instruments correctly with only occasional assistance 	<ul style="list-style-type: none"> – applies all (or almost all) of the dance/ music skills, concepts, and techniques taught – consistently performs and creates in well-developed ways – uses materials, and instruments with no help
Understanding of concepts -patterning	<ul style="list-style-type: none"> – by giving partially complete but inappropriate explanations – using only a few of the patterning required concepts 	<ul style="list-style-type: none"> – by giving appropriate but incomplete explanations – using more than half of the required patterning concepts 	<ul style="list-style-type: none"> – by giving both appropriate and complete explanations – using most of the required patterning concepts 	<ul style="list-style-type: none"> – by giving both appropriate and complete explanations, and by showing that he or she can apply the concepts in a variety of contexts – using all of the required patterning concepts



Pattern Play in the Arts
Patterning Algebra & Numeration An Integrated Unit for Grade 2

Selected **Assessed**

English Language---Writing

- 2e1** • communicate ideas (thoughts, feelings, experiences) for specific purposes (e.g., write a paragraph describing a trip to the farm for classmates); 1 **2**

English Language---Reading

- 2e30** • express clear responses to written materials, relating the ideas in them (thoughts, feelings, experiences) to their own knowledge and experience; 1

English Language---Oral and Visual Communication

- 2e47** • communicate messages, and follow instructions and directions; 1
- 2e55** – use appropriate vocabulary and oral language structures to express emotions in a variety of situations; 1
- 2e59** – use appropriate gestures and tone of voice, as well as natural speech rhythms, when speaking; 1

Mathematics---Number Sense and Numeration

- 2m2** • compare and order whole numbers using concrete materials, drawings, numerals, and number words to develop an understanding of place value; **2**
- 2m8** • use a calculator to skip count, explore number patterns, and solve problems beyond the required pencil-and-paper skills. **1**
- 2m9** – read and print number words to twenty; 1
- 2m10** – count by 1's, 2's, 5's, 10's, and 25's beyond 100 using multiples of 1, 2, and 5 as starting points; 1
- 2m13** – show counting by 2's, 5's, and 10's to 50 on a number line; **1**
- 2m14** – compare, order, and represent whole numbers to 100 using concrete materials and drawings; **1**
- 2m15** – use mathematical language to identify and describe numbers to 100 in the world around them; 1
- 2m17** – identify place-value patterns (e.g., trading 10 ones for 1 ten) and use zero as a place holder; 1
- 2m19** – represent and explain halves, thirds, and quarters as part of a whole and part of a set using concrete materials and drawings (e.g., colour 2 out of 4 circles); 1
- 2m21** – investigate the properties of whole numbers (e.g., addition fact families, $3 + 2 = 2 + 3$); 1
- 2m25** – recall addition and subtraction facts to 18; 1
- 2m27** – use one fact to find another (e.g., use fact families or adding on); 1
- 2m28** – mentally add and subtract one-digit numbers; 1
- 2m33** – select and use appropriate strategies (e.g., pencil and paper, calculator, estimation, concrete materials) to solve number problems involving addition and subtraction. **2**

Mathematics---Measurement

- 2m40** – record the results of measurement activities in a variety of ways (e.g., in graphs, stories); 1
- 2m44** – select an appropriate non-standard unit and an appropriate standard unit to measure length; 1
- 2m55** – use non-standard and standard units to solve measurement problems relating to themselves and their environment; **1**

Mathematics---Geometry and Spatial Sense

- 2m63** • understand key concepts in transformational geometry using concrete materials and drawings; **1**
- 2m75** – compare and contrast two-dimensional shapes; 1

Mathematics---Patterning and Algebra

- 2m82** • identify, extend, and create number, geometric, and measurement patterns, and patterns in their environment; **2** **1**
- 2m83** • explore patterns and pattern rules; **2** **1**
- 2m84** • identify relationships between and among patterns. **2**
- 2m85** – recognize that patterning results from repeating an operation (e.g., addition), using a transformation (slide, flip, turn), or making some other change to an attribute (e.g., position, colour); **1** **1**
- 2m86** – describe and make models of patterns encountered in any context (e.g., wallpaper borders, calendars), and read charts that display the patterns; **1**
- 2m87** – identify patterns (e.g., in shapes, sounds); **3** **1**
- 2m88** – combine two attributes in creating a pattern (e.g., size and position); **2** **1**
- 2m89** – identify patterns in addition and subtraction sentences; **2**
- 2m90** – explore multiples in a hundreds chart; **1**
- 2m91** – use a calculator and a computer application to explore patterns; 1
- 2m92** – relate growing and shrinking patterns to addition and subtraction; **2**



Pattern Play in the Arts
Patterning Algebra & Numeration An Integrated Unit for Grade 2

		Selected	Assessed
<input type="checkbox"/> 2m93	– explain a pattern rule;	2	3
<input type="checkbox"/> 2m94	– given a rule expressed in informal language, extend a pattern;	2	2
<input type="checkbox"/> 2m95	– transfer patterns from one medium to another (e.g., actions, words, symbols, pictures, objects, calculator).	1	3

Health and Physical Education---Fundamental Movement Skills

<input type="checkbox"/> 2p20	– travel in a variety of ways, changing pathways and directions (e.g., in creative dance, dances from other countries);		1
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The Arts---Music

<input type="checkbox"/> 2a1	• demonstrate an understanding of the basic elements of music specified for this grade (see below) through listening to, performing, and creating music;		1
<input type="checkbox"/> 2a5	• communicate their response to music in ways appropriate for this grade (e.g., through visual arts, drama, creative movement, language).	1	
<input type="checkbox"/> 2a6	– identify examples of beat in their environment and in music (e.g., ticking of clocks, steady pulse in rhymes or songs);	1	1
<input type="checkbox"/> 2a7	– identify rhythmic patterns (e.g., clap the pattern of syllables in nursery rhymes);	3	1
<input type="checkbox"/> 2a8	– distinguish between beat and rhythm in a variety of pieces of music;	1	
<input type="checkbox"/> 2a15	– create rhythmic and melodic patterns (e.g., ostinati), using a variety of sounds (e.g., vocal and instrumental sounds);	1	2
<input type="checkbox"/> 2a16	– create simple patterned movement to familiar music, using their knowledge of beat and rhythm;	2	
<input type="checkbox"/> 2a19	– accompany songs in an expressive way, using appropriate rhythm instruments, body percussion, or “found” instruments;	1	
<input type="checkbox"/> 2a21	– create short songs and instrumental pieces, using a variety of sound sources;	1	

The Arts---Visual Arts

<input type="checkbox"/> 2a28	• produce two- and three-dimensional works of art that communicate ideas (thoughts, feelings, experiences) for specific purposes and to familiar audiences;	2	
<input type="checkbox"/> 2a29	• use the elements of design (colour, line, shape, form, space, texture), in ways appropriate for this grade, when producing and responding to works of art;	1	

The Arts---Drama & Dance

<input type="checkbox"/> 2a48	• create short dance pieces, using techniques learned in this grade;	1	2
<input type="checkbox"/> 2a49	• communicate understanding of works in drama and dance through discussion, writing, movement, and visual art work;	1	1
<input type="checkbox"/> 2a50	• solve problems in various situations through role playing and movement in drama and dance.		1
<input type="checkbox"/> 2a60	– demonstrate the ability to move and control their bodies in space and time (e.g., by creating tableaux in small groups);	2	
<input type="checkbox"/> 2a63	– interpret songs, music, poetry, or images, using elements of movement (e.g., rhythm, space).	1	
<input type="checkbox"/> 2a67	– identify specific aspects (e.g., movements, words) of their work and that of others that were effective (e.g., the scary way the dancer stopped and turned).	1	



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

English Language

2e1	1	2	2e2	2e3	2e4	2e5	2e6	2e7	2e8	2e9	2e10		
2e11			2e12	2e13	2e14	2e15	2e16	2e17	2e18	2e19	2e20		
2e21			2e22	2e23	2e24	2e25	2e26	2e27	2e28	2e29	2e30	1	
2e31			2e32	2e33	2e34	2e35	2e36	2e37	2e38	2e39	2e40		
2e41			2e42	2e43	2e44	2e45	2e46	2e47	1	2e48	2e49	2e50	
2e51			2e52	2e53	2e54	2e55	1	2e56	2e57	2e58	2e59	1	2e60
2e61			2e62	2e63	2e64	2e65							

Mathematics

2m1		2m2	2	2m3	2m4	2m5	2m6	2m7	2m8	1	2m9	1	2m10	1										
2m11		2m12		2m13	1	2m14	1	2m15	1	2m16	2m17	1	2m18	2m19	1	2m20								
2m21	1	2m22		2m23		2m24		2m25	1	2m26	2m27	1	2m28	1	2m29	2m30								
2m31		2m32		2m33	2	2m34		2m35		2m36	2m37		2m38		2m39	2m40	1							
2m41		2m42		2m43		2m44	1	2m45		2m46	2m47		2m48		2m49	2m50								
2m51		2m52		2m53		2m54		2m55	1	2m56	2m57		2m58		2m59	2m60								
2m61		2m62		2m63	1	2m64		2m65		2m66	2m67		2m68		2m69	2m72								
2m73		2m74		2m75	1	2m76		2m77		2m78	2m79		2m80											
2m81		2m82	2	1	2m83	2	1	2m84	2	2m85	1	1	2m86	1	2m87	3	1	2m88	2	1	2m89	2	2m90	1
2m91	1	2m92	2	2m93	2	3	2m94	2	2	2m95	1	3	2m96		2m97		2m98		2m99		2m100			
2m101		2m102		2m103		2m104		2m105		2m106		2m107		2m108		2m109		2m110		2m111				
2m111		2m112																						

Science and Technology

2s1	2s2	2s3	2s4	2s5	2s6	2s7	2s8	2s9	2s10
2s11	2s12	2s13	2s14	2s15	2s16	2s17	2s18	2s19	2s20
2s21	2s22	2s23	2s24	2s25	2s26	2s27	2s28	2s29	2s30
2s31	2s32	2s33	2s34	2s35	2s36	2s37	2s38	2s39	2s40
2s41	2s42	2s43	2s44	2s45	2s46	2s47	2s48	2s49	2s50
2s51	2s52	2s53	2s54	2s55	2s56	2s57	2s58	2s59	2s60
2s61	2s62	2s63	2s64	2s65	2s66	2s67	2s68	2s69	2s70
2s71	2s72	2s73	2s74	2s75	2s76	2s77	2s78	2s79	2s80
2s81	2s82	2s83	2s84	2s85	2s86	2s87	2s88	2s89	2s90
2s91	2s92	2s93	2s94	2s95	2s96	2s97	2s98	2s99	2s100
2s101	2s102	2s103	2s104	2s105	2s106	2s107	2s108	2s109	2s110

Social Studies

2z1	2z2	2z3	2z4	2z5	2z6	2z7	2z8	2z9	2z10
2z11	2z12	2z13	2z14	2z15	2z16	2z17	2z18	2z19	2z20
2z21	2z22	2z23	2z24	2z25	2z26	2z27	2z28	2z29	2z30
2z31	2z32	2z33	2z34	2z35	2z36	2z37	2z38	2z39	2z40
2z41	2z42	2z43	2z44	2z45	2z46	2z47	2z48		

Health & Physical Education

2p1	2p2	2p3	2p4	2p5	2p6	2p7	2p8	2p9	2p10	
2p11	2p12	2p13	2p14	2p15	2p16	2p17	2p18	2p19	2p20	1
2p21	2p22	2p23	2p24	2p25	2p26	2p27	2p28	2p29	2p30	
2p31	2p32	2p33	2p34	2p35	2p36	2p37	2p38	2p39	2p40	
2p41										

The Arts

2a1	1	2a2	2a3	2a4	2a5	1	2a6	1	1	2a7	3	1	2a8	1	2a9		2a10				
2a11		2a12	2a13	2a14	2a15	1	2	2a16	2	2a17			2a18		2a19	1	2a20				
2a21	1	2a22	2a23	2a24	2a25			2a26		2a27			2a28	2	2a29	1	2a30				
2a31		2a32	2a33	2a34	2a35			2a36		2a37			2a38		2a39		2a40				
2a41		2a42	2a43	2a44	2a45			2a46		2a47			2a48	1	2	2a49	1	1	2a50	1	
2a51		2a52	2a53	2a54	2a55			2a56		2a57			2a58		2a59		2a60		2		
2a61		2a62	2a63	1	2a64			2a65		2a66			2a67	1							



Pattern Play in the Arts

Patterning Algebra & Numeration An Integrated Unit for Grade 2

Analysis Of Unit Components

- 10 Subtasks
- 95 Expectations
- 69 Resources
- 78 Strategies & Groupings
- Unique Expectations --
- 5 Language Expectations
- 33 Mathematics Expectations
- 1 Health & Physical Education
- 17 Arts Expectations

Resource Types

- 3 Rubrics
- 18 Blackline Masters
- 0 Licensed Software
- 25 Print Resources
- 1 Media Resources
- 1 Websites
- 7 Material Resources
- 10 Equipment / Manipulatives
- 0 Sample Graphics
- 4 Other Resources
- 0 Parent / Community
- 0 Companion Bookmarks

Groupings

- 6 Students Working As A Whole Class
- 4 Students Working In Pairs
- 3 Students Working In Small Groups
- 8 Students Working Individually

Assessment Recording Devices

- 8 Anecdotal Record
- 2 Checklist
- 3 Rating Scale
- 2 Rubric

Teaching / Learning Strategies

- 2 Brainstorming
- 1 Chanting
- 1 Collaborative/co-operative Learning
- 1 Concept Clarification
- 6 Demonstration
- 4 Direct Teaching
- 2 Discussion
- 2 Improvisation
- 1 Learning Log/ Journal
- 1 Open-ended Questions
- 1 Problem-solving Strategies
- 1 Think / Pair / Share

Assessment Strategies

- 1 Exhibition/demonstration
- 4 Learning Log
- 6 Observation
- 4 Performance Task
- 2 Questions And Answers (oral)
- 1 Response Journal
- 1 Select Response