

## ACTIVITY: WEAVING

### Materials

- Woven samples: yarn or ¼" wide (or slightly less) paper strips in 2 contrasting colours
- Stiff cardboard, tape, long craft needle or small flat shuttle
- 4/inch grid paper to match width of strips
- 8.5" x 14 sheets with weaves & grids (photocopied)
- Coloured pencils or markers, pencils, straight edge, scissors
- Magnifiers: loupes, magnifying glass, or (optional) digital microscope
- Display board(s), laminated information sheets, boxes of woven examples

### Skills

#### *Motor*

- Drawing
- Manipulating materials
- Hand-eye co-ordination

#### *Cognitive*

- Coding
- Counting, skip counting, repeating units
- Making and using number lines
- Pattern making
- Pattern decoding
- Symmetry
- Abstraction – relating real artefact to representational drawing to code representing it
- Cartesian grids, graphs
- Using colours symbolically
- Observing
- Experimenting
- Planning
- Overlapping

#### *Affective/metacognitive*

- Persevering
- Focusing on a task
- Adapting
- Problem solving

## Outcomes (Nova Scotia Curriculum)

### *Grade 4-6 Visual Art*

**Outcome 1:** Students will explore the creative process, individually and collaboratively, using a range of materials and technologies, to create with respect and sensitivity a variety of artworks that express feelings, ideas, and understandings

#### **Indicators:**

- Create artworks with emphasis on [the elements and principles of design](#)
- Create artworks for a variety of purposes, recognizing influences from personal, social, cultural, community, physical environment(s)
- Use variety of materials, technologies, and tools to create art in many forms, referencing examples from diverse cultures for inspiration

**Outcome 2:** Students will talk about art using their own words, incorporating vocabulary from the language of art to examine a range of past and contemporary artworks and aesthetic conventions from diverse cultures and communities, including Acadians, African Nova Scotians, Gaels, and Mi'kmaq, with respect and sensitivity

**Indicators:**

- Examine and discuss the elements and principles of design in artworks from various cultures
- Explore and describe the function and purpose of art across a variety of cultures, including personal artwork
- Examine art images throughout history and from various cultures to compare how artists create art to communicate ideas, feelings, and understandings

**Outcome 3:** Students will demonstrate an awareness of, reflect upon, and develop respect for the role of art, artists, and art making in society, keeping in mind cultural influences

**Indicators:**

- Explain the reasons why a particular subject matter and/or materials have been selected when creating personal artworks
- Share and discuss personal artwork and the artwork of others, using the language of art while posing questions that evoke critical thinking
- Listen to, engage in conversations, and respect the opinions of all
- Demonstrate respectful behaviour for the creative process of self and others

*Grade 4 Mathematics*

**SCO PR01** Students will be expected to identify and describe patterns found in tables and charts, including a multiplication chart

**Performance Indicators**

- PR01.02** Determine the missing element(s) in a given table or chart  
**PR01.04** Describe the pattern found in a given table or chart

**SCO PR02** Students will be expected to translate among different representations of a pattern (a table, a chart, or concrete materials)

**Performance Indicators**

- PR02.01** Create a table or chart from a given concrete representation of a pattern  
**PR02.02** Create a concrete representation of a given pattern displayed in a table or chart  
**PR02.03** Translate between pictorial, contextual, and concrete representations of a pattern  
**PR02.04** Explain why the same relationship exists between the pattern in a table and its concrete representation

**SCO PR03** Students will be expected to represent, describe, and extend patterns and relationships, using charts and tables, to solve problems

**Performance Indicators**

- PR03.01** Translate the information in a given problem into a table or chart  
**PR03.02** Identify, describe, and extend the patterns in a table or chart to solve a given problem

*Grade 5 Mathematics*

**CO PR01** Students will be expected to determine the pattern rule to make predictions about subsequent terms.

**Performance Indicators**

- PR01.01** Extend a given increasing or decreasing pattern, with and without concrete materials, and explain how each term differs from the preceding one  
**PR01.02** Describe, orally or in written form, a given pattern using mathematical language such as **one more**, **one less**, or **five more**  
**PR01.03** Write a mathematical expression to represent a given pattern, such as  $r + 1$ ,  $r - 1$ ,  $r + 5$   
**PR01.04** Describe the relationship in a given table or chart using a mathematical expression  
**PR01.05** Determine and explain why a given number is or is not the next term in a pattern  
**PR01.06** Predict subsequent terms in a given pattern  
**PR01.07** Solve a given problem by using a pattern rule to determine subsequent terms  
**PR01.08** Represent a given pattern visually to verify predictions

## Essential Graduation Competencies

### COMMUNICATION (Com)

- consider the effectiveness of communication in relation to the intended purpose, audience, and choice of media

### CREATIVITY AND INNOVATION (CI)

- collaborate to create and innovate
- reflect and learn from trial and error
- recognize creative processes are vital to innovation

### CRITICAL THINKING (CT)

- use critical thinking skills to inquire, make decisions and solve problems (provide examples to support opinions)
- begin to understand that critical thinking is valuable
- demonstrate curiosity, inquisitiveness, creativity, flexibility, and persistence

### TECHNOLOGICAL FLUENCY (TF)

- recognize technology encompasses a range of learning tools and contexts
- apply technology effectively and productively
- begin to consider how technology and society impact and advance one another

## Big Idea

### Weaving $\longleftrightarrow$ Coding

Weaving code is needed to transpose the design idea of a desired cloth onto the mechanism of actual weaving, whether by hand manipulation or with the use of a loom. Coding works both ways. The idea of how the woven structure is to look is coded into a set of weaving instructions, sometimes from a drawing. The set of weaving instructions is used to produce the woven structure. Any woven cloth can be decoded into a set of weaving instructions for documentation and reproduction.

In paper strip weaving, the horizontal strips are manipulated over and under the vertical strips by hand, as desired or according to the planned weaving pattern/code. In weaving with yarn, the horizontal threads are woven over and under the taut vertical threads with a hand-held needle and pulled through, as desired or according to the planned weaving pattern/code.



- d. This becomes a new code to draw out on grid paper or weave in paper strips, making several repetitions of the set, until they at least have a square sample (or longer).

### Questions/Discussion/Analysis/Making with Rigour

1. Can you find any repeating patterns or sequences of over and under?
2. What is the least number of vertical and horizontal lines needed to make this repeated pattern?
3. What happens if you weave the code lines in order and then in backwards order?
4. How does this connect with everyday contexts?
  - a. eg. clothes people wear, such as jeans, suits, shirts, saris, scarves
  - b. eg. household fabrics, such as curtains, tablecloths, towels
5. How does this connect with technologies?
  - a. weaving technology evolved more complex looms in order to make more complex weaving patterns and images
  - b. the desire for pattern and image drove technology forward
6. How does this connect with social history?
  - a. The industrial revolution began with mechanised power looms and textile printing
  - b. Mechanisation improved the speed, consistency, and economy of cloth production
  - c. This made more varieties of fabrics available affordably to more people
  - d. Mechanisation also replaced many industrial jobs done by skilled workers.
7. How does this connect with the history of computers?
  - a. the binary up-down motion of looms weaving threads inspired and provided initial models for computer programming
  - b. the use of punched cards in jacquard weaving became the programming mechanism for early computers
8. What happens if ...? This is one of the most important questions, as it leads to discovery and innovation.
  - a. Vary the code  $\leftrightarrow$  vary the pattern.
  - b. How many variations can you make?
  - c. How many ways can you vary the code? (eg. by going backwards, by skipping a line, etc.)
  - d. What happens if you use more than one colour in either or both directions?
  - e. How could you add code for making colour changes?