

Five Principles for Supporting Literacy and Cultural Awareness in Mathematics

Using the research of numerous language experts, Pearson, led by Dr. Jim Cummins, has developed an instructional framework incorporating five essential principles for teaching content to English learners.

1 Identify and Communicate Content and Language Objectives

Present content objectives.

- Simplify language, repeat, and paraphrase.
- Avoid idioms and check for understanding.

Present language objectives.

- Focus on key content vocabulary and academic vocabulary.
- Focus on language form and function (essential to lesson).

2 Provide Appropriate Preteaching

Preteach the lesson's elements.

- Activate prior knowledge and build background.
- Preview the text and set a purpose for reading.

3 Provide Comprehensible Input

Make oral content comprehensible by providing support.

- Use visuals and graphic organizers.
- Model and demonstrate.
- Use summaries.
- Use audio and audiovisual aids.

4 Enable Language Production

Create opportunities for oral practice.

- **Listening and Speaking** Model language and allow wait time for responses.
- **Reading and Writing** Provide support and scaffolding.
- **Increasing Interaction** Assign collaborative tasks with peers.

5 Assess for Content and Language Understanding

Monitor progress and reteach when necessary.

- **Diagnostic Assessment** Determine placement.
- **Formative Assessment** Check comprehension on an ongoing basis.
- **Summative Assessments** Use alternative assessments, such as projects and portfolios.
- **Accommodations** Allow extra time; use bilingual dictionaries.

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1. Identify and Communicate Content and Language Objectives

2. Provide Appropriate Preteaching

3. Provide Comprehensible Input

4. Enable Language Production






5. Assess for Content and Language Understanding



Raven (Part 1)

Learning Intentions

I can ...

- ✓  listen respectfully to a story.
- ✓  speak with bravery about a lesson learned from a story.
- ✓  draw a pentomino.
- ✓  present what I know about a pentomino with humility and honesty.
- ✓  write about a pentomino.



Book Walk

- ❖ *We are going to do a Book Walk of Raven. I want you to use only your eyes to notice what is happening in the pictures as we preview the story.*
- ❖ *What are you noticing?*

Activate Prior Knowledge

- ❖ While in a circle and after introductions, listen to a story that reminds us about the purpose of oral storytelling in First Nations cultures and listen to an elder's version of *Raven Brings/Steals Light*. (Oral storytelling is the way in which stories and life lessons are passed from person to person and from generation to generation. Storytelling is the active link with tradition, with the past and with Elders.)
- ❖ Review the Learning Intentions chart.
- ❖ Show a bentwood box or images of bentwood boxes. Encourage students to use the key vocabulary.
 - Ask: *Have you ever seen a box like this before?*
 - Ask: *What do you know about boxes like this?*
 - Ask: *What shapes do you see?*
 - Ask: *What could you hold in the box?*

- ❖ Review the Turn and Talk criteria chart.
Students Turn and Talk using the prompts above.
(If it does not come up in the discussion, share that bentwood boxes were made watertight that allowed them to be used to store things like musical instruments, clothing, food, and for cooking, in transportation on water, and for burials.)
- ❖ Start the Key Vocabulary Chart with bentwood box.

Purpose

- ❖ Review the Learning Intentions chart.
- ❖ *You may have heard this story or a similar story before. Each time we listen to a story we hear something different. As you listen to the story, Raven, I want you to think about how the bentwood boxes and its top are important in the story. Also, think about what lesson could be learned from listening to this story?*


Read-aloud


- ❖ Read the book to the class.
- ❖ Emphasize the bentwood box in the story.

Summarize

- ❖ Ask students why the boxes were important in the story and what lessons could be learned from listening to this story.

Performance Tasks

- ✓  I can listen respectfully to a story.
 - ❖ Review the Learning Intentions chart.
Remind the class that they listened to stories about the purpose of oral storytelling, the visiting elder, as well as *Raven*

- ✓  I can speak with bravery about a lesson learned from a story.
 - ❖ Review the Learning Intentions chart.
 - ❖ Review the Turn and Talk Criteria chart.

- ❖ Model a Turn and Talk about a lesson learned from a story using the sentence frame:
→ One thing that I learned from a story in class today was ___.
- ❖ Students Turn and Talk using the prompt above.

✓  I can draw a pentomino.

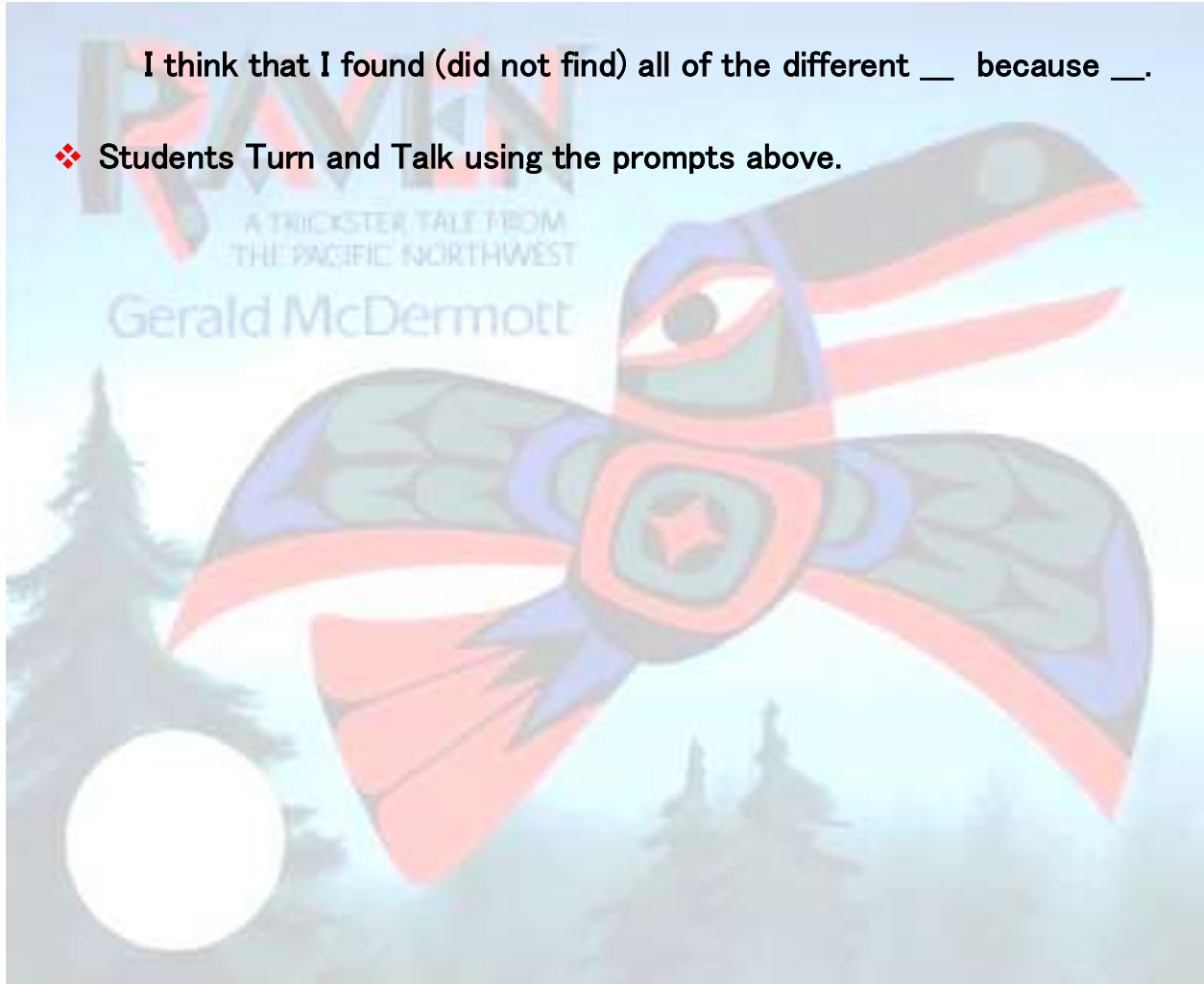
- ❖ Review the Learning Intentions chart.
- ❖ *In the story, Raven’s mother removed the tops from the bentwood boxes and light poured out. Later, we will use pentominoes to help us figure out how to build a model of an open box. Add pentomino to the Key Vocabulary Chart.*
- ❖ A pentomino is a shape that is made up of 5 congruent squares joined by a side. Complete a Frayer Chart for the word pentomino with the class by providing examples and non-examples. Be sure to note as a fact that some pentominoes can be used to make an open box.
- ❖ As the pentomino definition is developed, continue to generate a Key Vocabulary chart with the students. (e. g. bentwood box, pentomino, edge/side, square, congruent, 2-dimensional (2-D) figure/shape, (vertex, face, 3-dimensional (3-D) object)
- ❖ Provide students with five square tiles and a sheet of square grid paper or sticky note grid paper for recording. After providing a model, challenge them to see how many different pentominoes they can find and record. (Shapes that are slides, flips or turns of other shapes or translations, reflections, or rotations of other shapes are not considered different. Good discussions will come from deciding if some shapes are different and if all shapes have been found. Resist telling the class how many different pentominoes could be found.)
- ❖ Gather a class set of all of the different pentomino shapes on the board. Challenge the students to determine if all of the pentominoes that are on the board are, in fact, different. Make a list of the transformational geometry-type words that the students use as they talk about the different pentominoes. If time permits, or on another day, after modelling with an example, consider having the students group the words.

- ✓  I can present what I know about a pentomino with humility and honesty.

- ❖ Review the Learning Intentions chart.
- ❖ Model a Turn and Talk about a pentomino using the sentence frames:
 - I found __ different __.
 - I think that they are __ because __.

I think that I found (did not find) all of the different __ because __.

- ❖ Students Turn and Talk using the prompts above.




✓  I can speak with bravery about a lesson learned from a story.

✓  I can write about a pentomino.

❖ Review the Learning Intentions chart.

❖ Model writing about a pentomino using the same sentence frames.

✓  I can present what I know about a pentomino with humility and honesty.

❖ Review the Learning Intentions chart.

❖ After serving the elder tea and bannock and while enjoying a snack together, wrap-up with circle sharing.

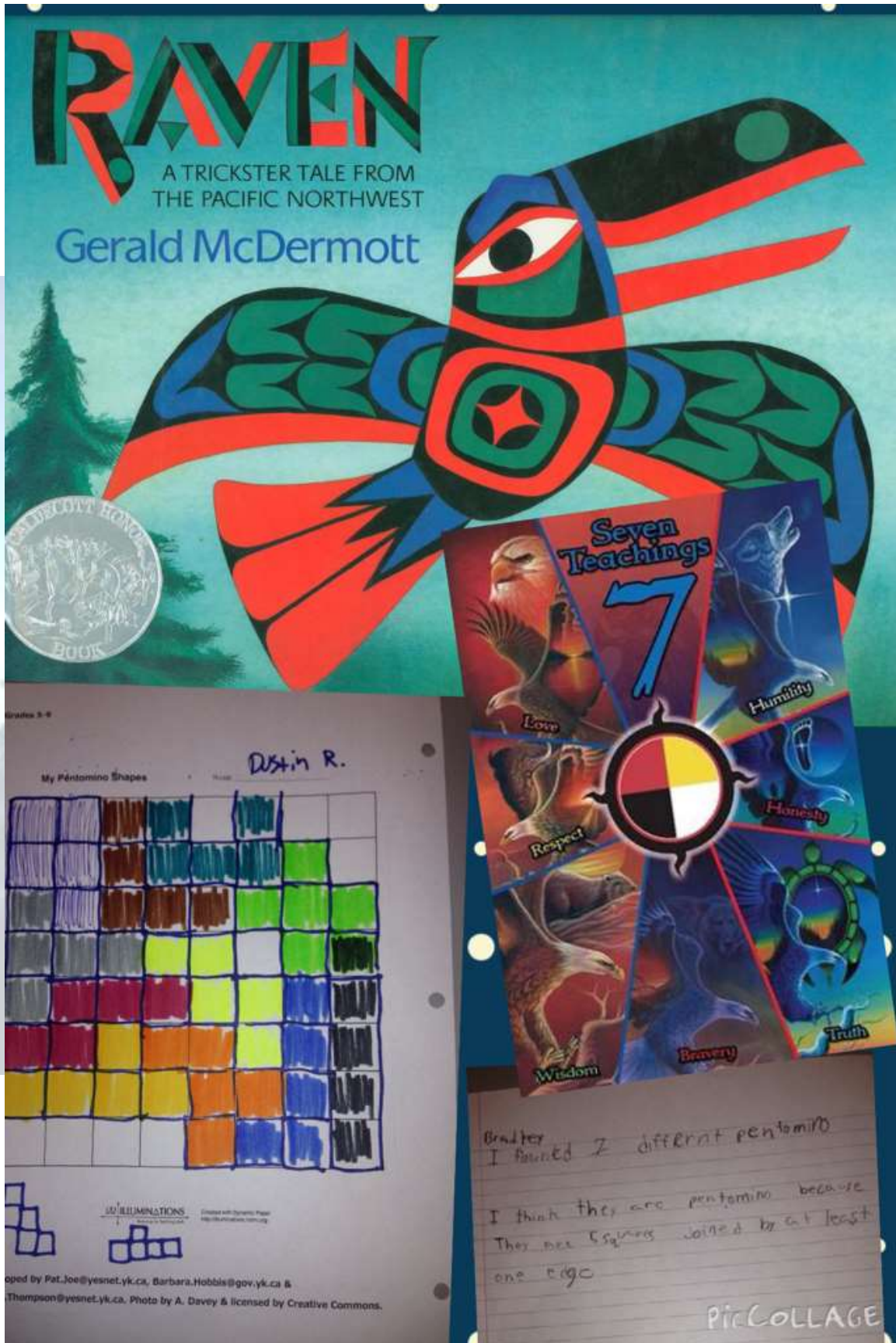
Sentence Frames

→ One thing that I learned from a story in class today was ___.

→ I found ___ different ___.

I think that they are ___ because ___.

I think that I found (did not find) all of the different ___ because ___.



Raven Resources and Extension Ideas

☒ [5 Principles for Teaching Content to English Learners](#)

☒ *Raven* by Gerald McDermott

☒ Use pentominoes or colour tiles in other lessons.

☒ Incorporate the use of a [Frayer Model](#) for vocabulary instruction as a regular part of lessons.

☒ Use other stories that are rich in social and emotional learning opportunities as jumping off points for other lessons.

☒ Raven is a shape shifter & transforms in the story *Raven*. Consider re-using the book as part of a transformational geometry lesson.

☒ *The Bentwood Box: An Activity Book* by Nan McNutt



☒ [Teaching Math in a First Peoples Context, Grades 8 and 9](#)

☒ In *Achieving Aboriginal Student Success – A Guide for K to 8 Classrooms*, Pamela Rose Toulouse outlines how reading, writing, speaking, listening, and presenting are guided by the seven goodlife teachings: respect, love, bravery, wisdom, humility, honesty, and truth.

☒ Use hexominoes (an arrangement of six squares with at least one side of each meeting) in other lessons.

- ✎ Using visualization, ask students to decide if a pentomino could be folded into an open box. Ask: If it will not fold into an open box, how would it need to be changed? Why?

Sample sentence frames:

→ These are some of the ___ that I think could be cut out and folded into open boxes:

(include sketches here.)

These are some of the ___ that I think can not be cut out and folded into open boxes:

(include sketches here.)

To make an open box the pentominoes ___.

- ✎ Explore the number of shapes that can be made from six equilateral triangles.

- ✎ http://www.yesnet.yk.ca/firstnations/books/pp_web/ravenlight_pp.pdf

- ✎ Consider incorporating a related Numeracy Net checkpoint into your instruction:

- ✓ **Grades K–2** Checkpoint 12 & **Grade 3** Checkpoint 15: The student recognizes and describes geometric properties of two-dimensional figures and three-dimensional objects.
- ✓ **Grade 4** Checkpoint 13: The student distinguishes between two-dimensional shapes and three-dimensional objects, and describes their geometric properties.
- ✓ **Grade 5** Checkpoint 17: The student recognizes the shape, number, and arrangement of faces of three-dimensional objects.
- ✓ **Grade 6** Checkpoint 13: The student classifies polygons by considering geometric properties.
- ✓ **Grade 8+** Checkpoint 12: The student identifies and creates nets for 3D objects.

OR

Grades 3–9

- ✓ **Grade 5** Checkpoint 18: The student visualizes and demonstrates a transformation of a shape.
- ✓ **Grade 6** Checkpoint 16 and **Grade 7** Checkpoint 17: The student identifies and distinguishes between translations, reflections, and rotations.



My Pentomino Shapes

NAME _____



Created with Dynamic Paper
<http://illuminations.nctm.org>

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NAME _____



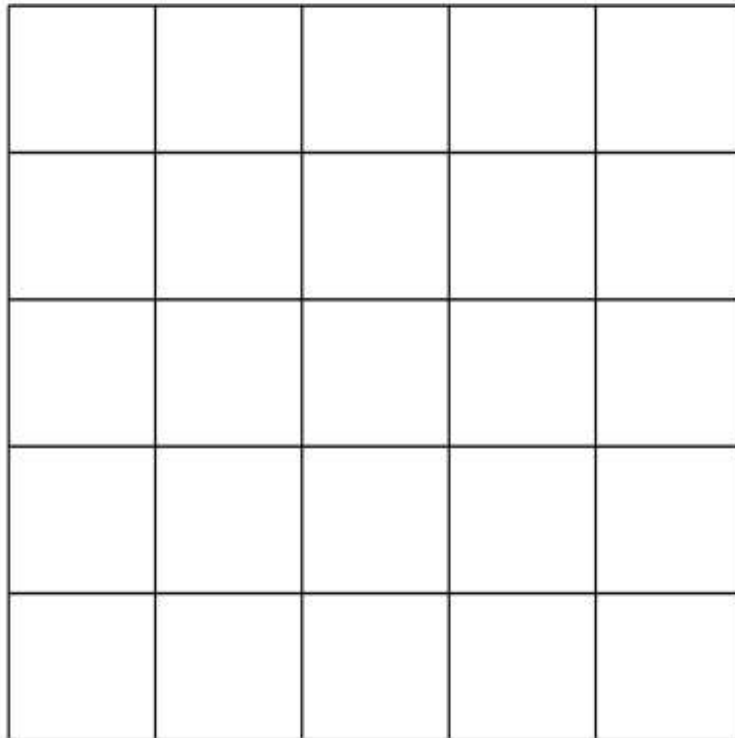
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COLOR TILE WRITING PAPER

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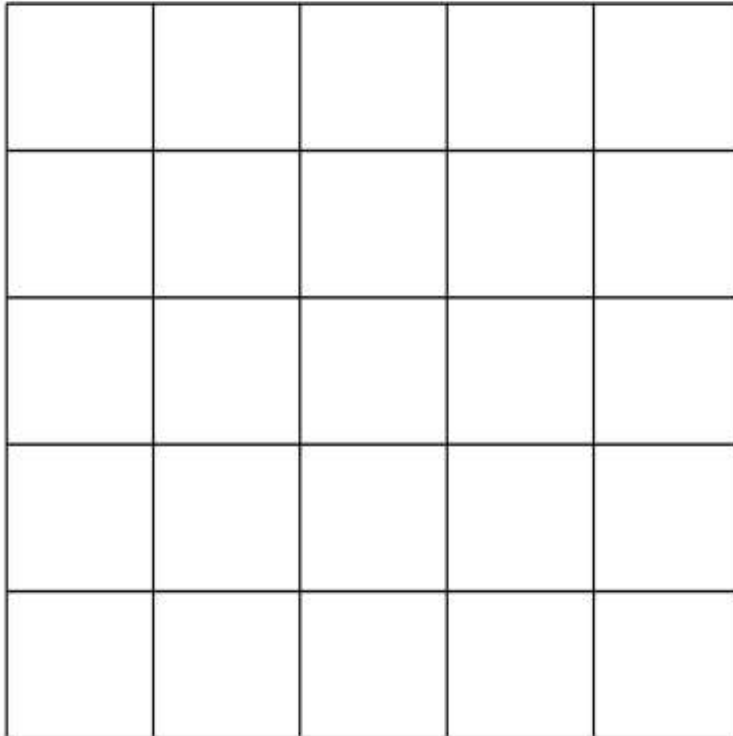
A Pentomino Shape

NAME _____



A Pentomino Shape

NAME _____



Two Stars and a Wish Name: _____





