There's A Moosematician on the Loose!

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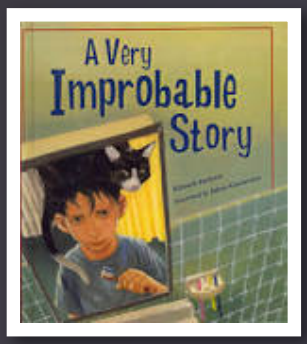


Learning Intentions

Students will…

- **use probability to take chances in a game.**
- **talk about strategies used in playing a game.**
- **write about a strategy used in playing a game.**

Activate Prior Knowledge

- **Review the Turn and Talk criteria chart.**
- **Review the Key Vocabulary chart.**
- ***Can anyone make a sentence using one of the key vocabulary words to describe something from their own life?* (Model how to do this and then ask for student example)**
- **Students Turn and Talk using the prompt above.**
- ***If I gave you math homework tonight, but said that I might collect it tomorrow, would you do the homework?* (Illicit student responses and emphasis the key vocabulary words *chance* and *choice*)**

Book Walk

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

Purpose

- **Review the Learning Intentions chart.**
- ***As you get older, you have to make choices based on the idea of chance. Today we will play a game called MOOSE that involves chance- you will have to make choices to win! As we view the book, A Very Improbable Story, I want you to think about how the key vocabulary words we talked about are important in the story* and how they can help you when playing a game.**

Read-aloud

- Read up to page 21
- Emphasize key words on pages 3, 7, 9 and 19.

Performance Tasks

a) Playing the game of MOOSE

- Review the Learning Intentions chart.
- Discuss the rules, game play and scoring for MOOSE.
- Model how to play MOOSE and emphasize key vocabulary.
- Begin game play for the first three rounds. Ask students questions related to strategy:
  - → *It looks like you made the choice to take a chance!*
  - → *Can you tell me why are some of you taking a chance and still standing?*
  - → *You will use chance to figure out whether you want to take a risk and keep playing.*

b) Discussing strategy in the game of MOOSE

- Review the Learning Intentions chart.
- *A strategy is a pattern of decisions to help us make choices.*
- *What would your strategy be when playing dodge ball?*
- *Think of strategies that we've been using in the game of MOOSE. Why do we play it safe? Why do we take a risk?*
- Make a group strategy harvest for the game of MOOSE.
- Continue with Round 4 of game play. After the first roll, model a Turn *and Talk about choice and strategy for the game of MOOSE using the* strategy harvest and the sentence frame:
  - → I am going to _____ because _____.
- Students Turn and Talk using the prompt above.
- Continue the game of MOOSE through to the end of Round 5.
- Summarize the outcome of the game and add to the Strategy Harvest.

c) Write about a Strategy

- Model how to write about a strategy from playing the game MOOSE using sentence frames and key vocabulary.
- Students write about a strategy from playing the game MOOSE using sentence frames and key vocabulary.

Sentence Frames

A play-it-safe strategy is _____.

A take-a-risk strategy is _____.

A play it safe strategy is to sit down when I have a sum so I don't lose it.

A Play it Safe strategy is to choose sit down when I know have a lot of points

A Take A Risk strategy is when I have low points I ~~decide~~ choose to stay standing

Key Vocabulary

chance
choice

win
lose

likely
unlikely

probability
strategy

Turn and Talk

What counts when we talk about our learning with a partner?

- stay on topic
- both people are
- respectful lis ing
- thank your tner

Strategies

Play-it-safe

Take-a-risk

I am going to _____ because _____.

A play-it-safe strategy is...

A take-a-risk strategy is...

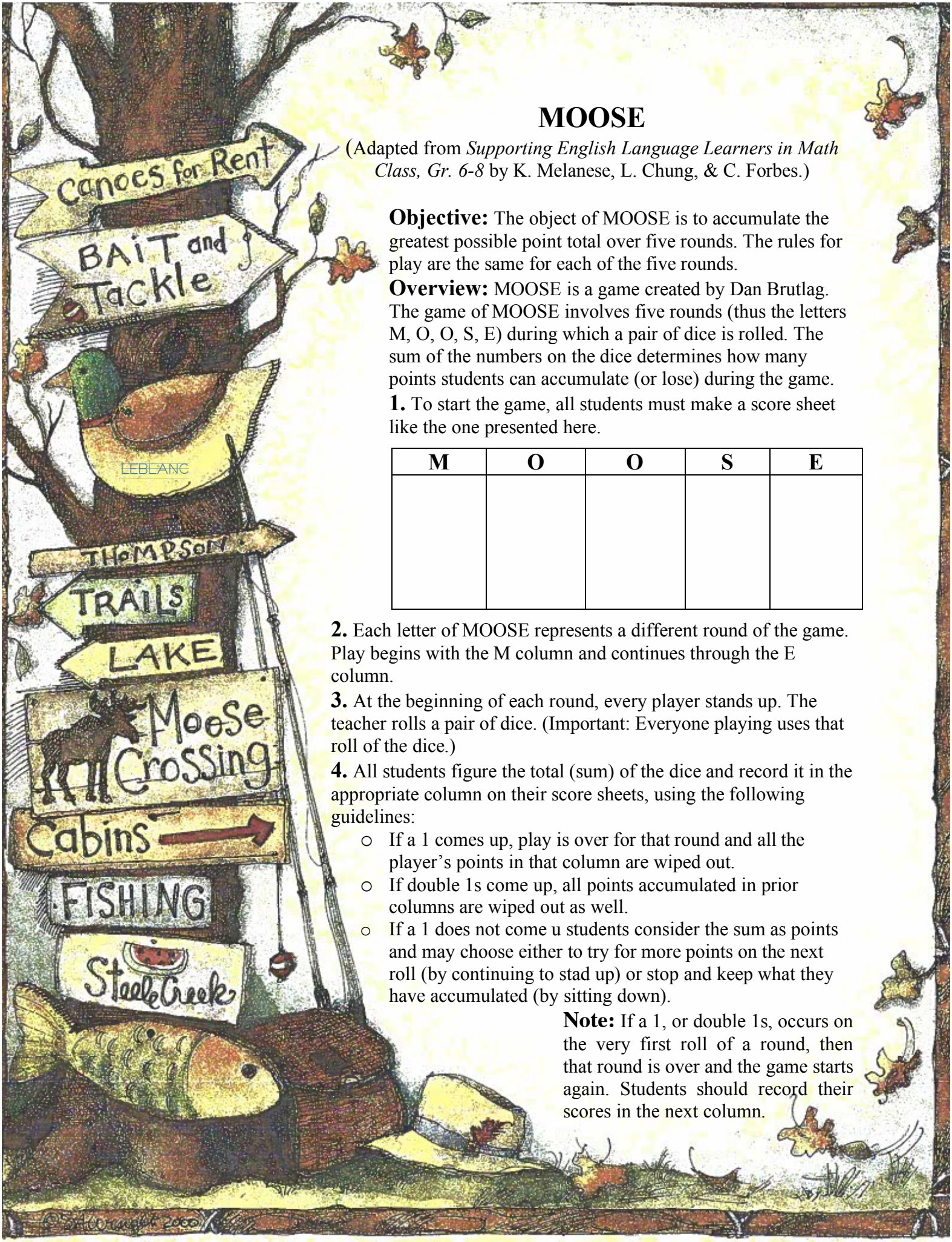
I can...

use probability to take chances in a game.

talk about strategies I use in a game.

write about a strategy I use in a game.

Be sure to check the conference website for additional moose-themed mathematics resources for your classroom.



MOOSE

(Adapted from *Supporting English Language Learners in Math Class, Gr. 6-8* by K. Melanese, L. Chung, & C. Forbes.)

Objective: The object of MOOSE is to accumulate the greatest possible point total over five rounds. The rules for play are the same for each of the five rounds.

Overview: MOOSE is a game created by Dan Brutlag. The game of MOOSE involves five rounds (thus the letters M, O, O, S, E) during which a pair of dice is rolled. The sum of the numbers on the dice determines how many points students can accumulate (or lose) during the game.

1. To start the game, all students must make a score sheet like the one presented here.

M	O	O	S	E

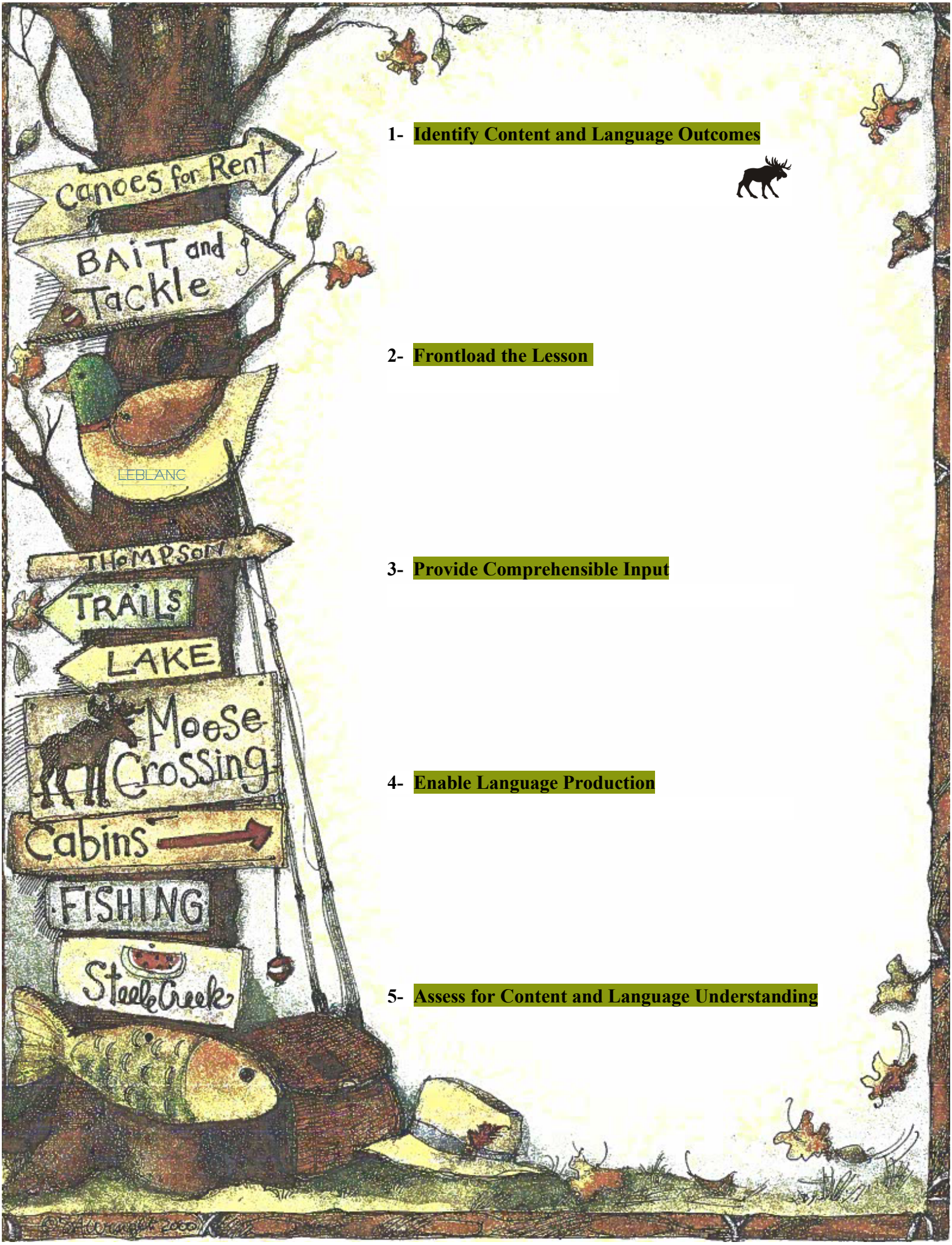
2. Each letter of MOOSE represents a different round of the game. Play begins with the M column and continues through the E column.

3. At the beginning of each round, every player stands up. The teacher rolls a pair of dice. (Important: Everyone playing uses that roll of the dice.)

4. All students figure the total (sum) of the dice and record it in the appropriate column on their score sheets, using the following guidelines:

- If a 1 comes up, play is over for that round and all the player's points in that column are wiped out.
- If double 1s come up, all points accumulated in prior columns are wiped out as well.
- If a 1 does not come u students consider the sum as points and may choose either to try for more points on the next roll (by continuing to stad up) or stop and keep what they have accumulated (by sitting down).

Note: If a 1, or double 1s, occurs on the very first roll of a round, then that round is over and the game starts again. Students should record their scores in the next column.



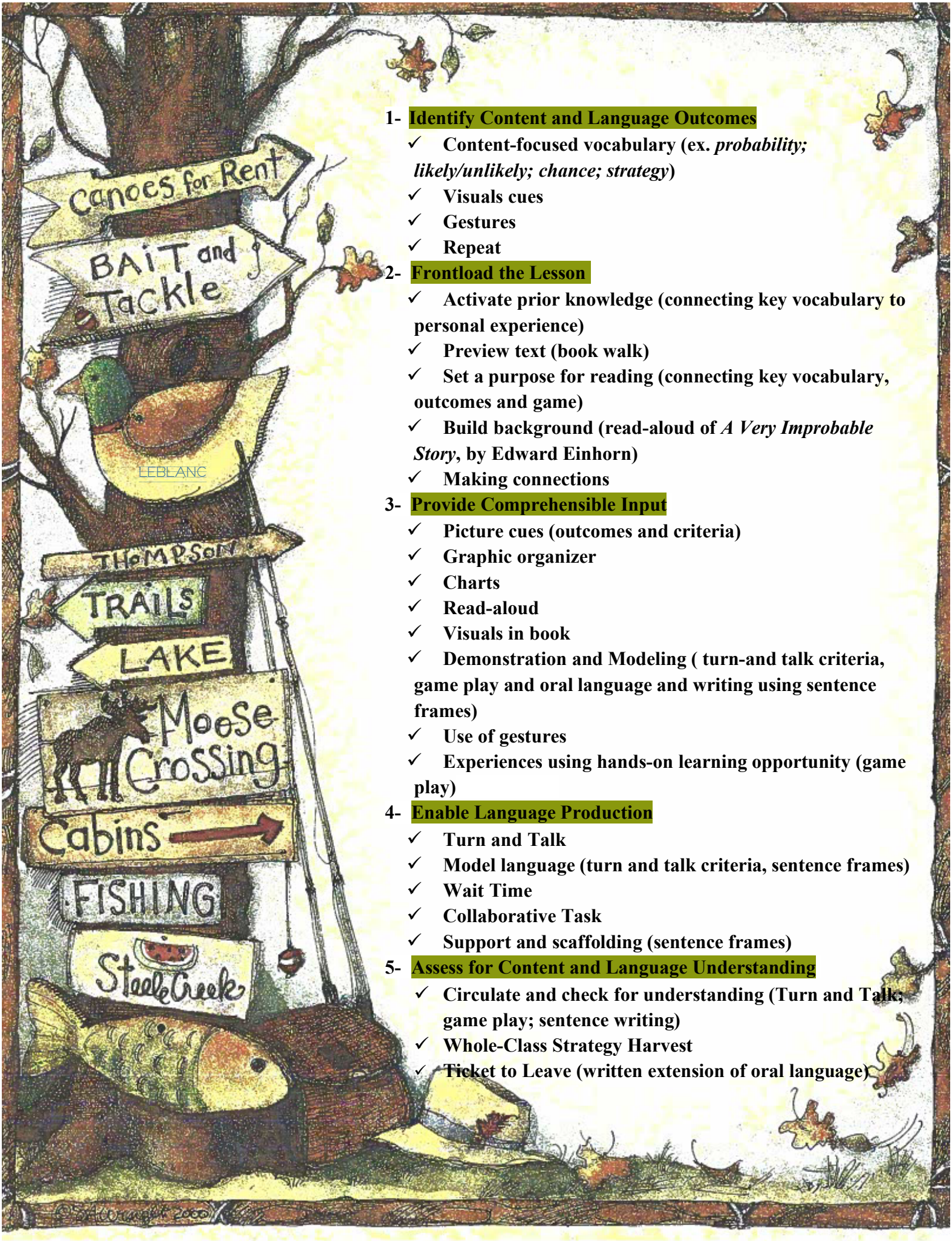
1- **Identify Content and Language Outcomes**

2- **Frontload the Lesson**

3- **Provide Comprehensible Input**

4- **Enable Language Production**

5- **Assess for Content and Language Understanding**



1- **Identify Content and Language Outcomes**
   - ✓ **Content-focused vocabulary (ex. *probability; likely/unlikely; chance; strategy*)**
   - ✓ **Visuals cues**
   - ✓ **Gestures**
   - ✓ **Repeat**

2- **Frontload the Lesson**
   - ✓ **Activate prior knowledge (connecting key vocabulary to personal experience)**
   - ✓ **Preview text (book walk)**
   - ✓ **Set a purpose for reading (connecting key vocabulary, outcomes and game)**
   - ✓ **Build background (read-aloud of *A Very Improbable Story*, by Edward Einhorn)**
   - ✓ **Making connections**

3- **Provide Comprehensible Input**
   - ✓ **Picture cues (outcomes and criteria)**
   - ✓ **Graphic organizer**
   - ✓ **Charts**
   - ✓ **Read-aloud**
   - ✓ **Visuals in book**
   - ✓ **Demonstration and Modeling (turn-and talk criteria, game play and oral language and writing using sentence frames)**
   - ✓ **Use of gestures**
   - ✓ **Experiences using hands-on learning opportunity (game play)**

4- **Enable Language Production**
   - ✓ **Turn and Talk**
   - ✓ **Model language (turn and talk criteria, sentence frames)**
   - ✓ **Wait Time**
   - ✓ **Collaborative Task**
   - ✓ **Support and scaffolding (sentence frames)**

5- **Assess for Content and Language Understanding**
   - ✓ **Circulate and check for understanding (Turn and Talk; game play; sentence writing)**
   - ✓ **Whole-Class Strategy Harvest**
   - ✓ **Ticket to Leave (written extension of oral language)**

Empowering
English Language Learners
with Results that Matter

5 Principles for Teaching Content to English Language Learners

All children deserve equal access to content—regardless of language level or ability. To achieve this equity, Pearson has developed an instructional framework incorporating five essential principles. This instructional framework is based on the research of numerous language experts, including Dr. Jim Cummins.

1. Identify and Communicate Content and Language Objectives

When presenting content objectives

- **Simplify language** (active voice, use same terms consistently)
- **Paraphrase**
- **Repeat**
- **Avoid** idioms and slang
- **Be aware** of homophones and multiple-meaning words
- **Clarify** (with simplified language, gestures, visuals)
- **Check** for understanding

When working with language objectives focus on

- **Key content vocabulary**
- **Academic vocabulary** found across the curriculum
- **Language form and function** essential for the lesson

Visit PearsonELL.com

2. Frontload the Lesson

Provide opportunities to frontload or preteach lesson elements.

- **Activate prior knowledge** by connecting to students' academic, cultural, or personal experiences.
- **Build background** by explaining new vocabulary or unfamiliar facts and concepts.
- **Preview text** by reviewing visuals, headings, and/or highlighted text.
- **Set a purpose for reading** by clarifying comprehension questions at the end of the lesson.
- **Make connections** by helping students see relationships between the lesson and other aspects of their lives.

3. Provide Comprehensible Input

Make oral and written content accessible by providing support.

- **Visuals** photos, illustrations, cartoons, multimedia
- **Graphics** graphs, charts, tables
- **Organizers** graphic organizers, outlines
- **Summaries** text, audio, native language

(continued on back)

PEARSON

3. Provide Comprehensible Input *(continued)*

- **Audio** recordings, read-alouds
- **Audiovisual aides** videos, dramatizations, props, gestures
- **Models** demonstrations and modeling
- **Experiences** hands-on learning opportunities, field trips

4. Enable Language Production

Structure opportunities for oral practice with language and content.

Listening and speaking

- Make listening input understandable with a variety of support.
- Model language.
- Allow wait time for students to plan what they say.

Reading and writing

- Tailor the task to each student's proficiency level.
- Provide support and scaffolding.
- Expect different products from students with different levels of proficiency.

Increasing interaction

- Provide collaborative tasks so students can work together.
- Encourage the development of relationships with peers.
- Lower anxiety levels to enable learning, as indicated by brain research.

5. Assess for Content and Language Understanding

Monitor progress and provide reteaching and intervention when necessary.

Diagnostic Assessment

- Determine appropriate placement.
- Identify strengths and challenges.

Formative Assessment

- Check comprehension in ongoing manner.
- Use appropriate instruction and pacing.

Summative Assessments

- Provide alternative types of assessment when possible, such as projects and portfolios.
- Provide practice before administering formal tests.

Accommodations

- Provide extra time.
- Use bilingual dictionaries.
- Offer oral presentation of written material.

PearsonELL.com

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PearsonSchool.com
800-848-9500

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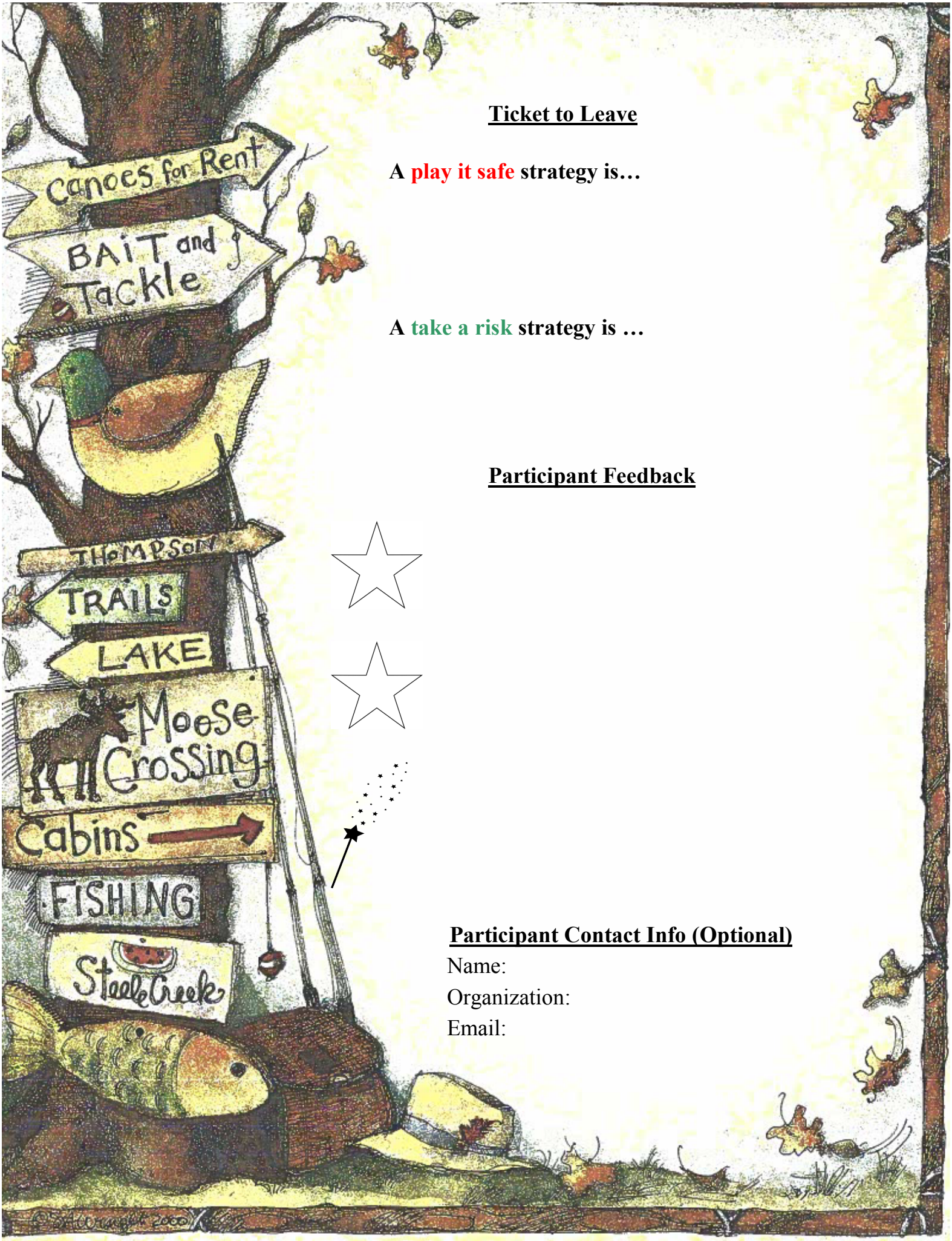


Ticket to Leave

A play it safe strategy is…

A take a risk strategy is …

Participant Feedback

Participant Contact Info (Optional)

Name:

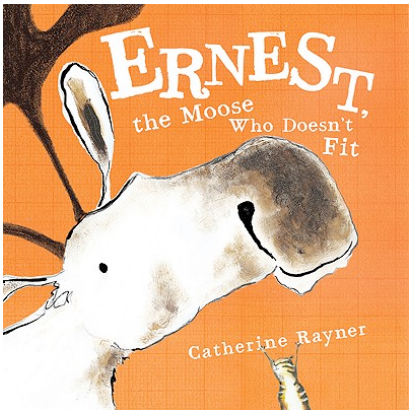
Organization:

Email:

Moose Math

(and if you want to get all fancy about it . . . "Moose Mathematics.")

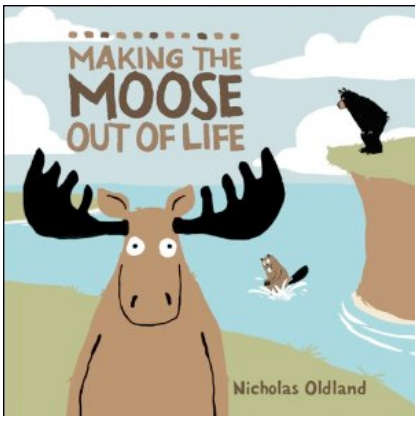
But first, a read aloud of "Ernest" by Catherine Rayner.



Today, we will be playing some moose-themed games; but, please refer to the handout for more moose-themed math ideas:

- ★ Using Games in the Mathematics Classroom
- ★ Using Children's Literature in the Mathematics Classroom
- ★ Using Photographs in the Mathematics Classroom
- ★ Other Moose-Themed Math
- ★ Other Moose Resources in the Yukon Education Teachers' Professional Library

Finally, "Making The Moose Out Of Life."
This book is also available in French. (L'Orignal Qui Avait La Frousse)



From the creator of Big Bear Hug comes the comic-adventure story of a mild-mannered moose who learns how to take life by the antlers. This moose may live in the wild, but he doesn't act it -- he watches from the

sidelines as his friends have fun. Every now and then, he wonders if he is missing out on anything. When the moose finally takes a chance and goes on a solo sailing trip, a raging storm carries him far from everything he knows. Will he curl up in a ball and cry, or make the most of it? The moose's unlikely hero-journey is a lighthearted, contemporary fable that celebrates living life to the fullest.

Here are a few of my other favourite moose-themed books:

- ★ Elusive Moose by Joan Gannij & Clare Beaton
- ★ One Moose, Twenty Mice by Clare Beaton
- ★ If You Give A Moose A Muffin by Laura Numeroff
- ★ George's Anters by Bruno St-Aubin
- ★ Moose and Magpie by Bettina Restrepo
- ★ A Tahltan Cook Book Vol.1: George and Grace Edzerza Family Edited by Louise S. Framst

Mathematics moose are definitely on the loose! The activities just keep "antlering" their way in; but, it shows how educators can take a northern themed idea and expand it to include all kinds of mathematical tasks.

From The IRP - **Connections**

Contextualization and making connections to the experiences of learners are powerful processes in developing mathematical understanding. When mathematical ideas are connected to each other or to real-world phenomena, students can begin to view mathematics as useful, relevant, and integrated. Learning mathematics within contexts and making connections relevant to learners can validate past experiences, and increase student willingness to participate and be actively engaged. The brain is constantly looking for and making connections. "Because the learner is constantly searching for connections on many levels, educators need to orchestrate the experiences from which learners extract understanding… Brain research establishes and confirms that multiple complex and concrete experiences are essential for meaningful learning and teaching" (Caine and Caine 1991, p. 5).

Connections: Balanced Life, Hands-on, Games, Children's Literature, Moose, Photography, Technology

Using Games in the Mathematics Classroom (K-12)

- **MOOSE**
- **Moose Tracks**
- **Moose Nim**
- **Six Moose**
- **"If You Give A Moose A Muffin" - Wild Tic-Tac-Toe**
- **Moose Farkel**
- **Moose Track Math: An Addition and Subtraction Bingo Game**
- **Bullwinkle Math**

Families Ask: Games in the Middle School http://www.nctm.org/eresources/article_summary.asp?URI=MTMS2005-09-94a&from=B

- **MOOSE** (The game sheets are in the math games journal.)

Curriculum Connections for "MOOSE"

Grade 1

- Recognize, at a glance, and name familiar arrangements of 1 to 10 objects or dots.
- Demonstrate an understanding of counting by:
  - Indicating that the last number said identifies "how many"
  - Using the counting on strategy
  - Using parts or equal groups to count sets
- Demonstrate an understanding of addition of numbers with answers to 20 (and their corresponding subtraction facts), concretely, pictorially, and symbolically by
  - Using familiar and mathematical language to describe additive (and subtractive actions) from their experience
  - Creating and solving problems in context that involve addition (and subtraction)
  - Modeling addition (and subtraction) using a variety of concrete and visual representations, and recording the process symbolically
- Describe and use mental mathematics strategies (memorization not intended), such as
  - Counting on (and counting back)
  - Making ten
  - Doubles
  - (Using addition to subtract)

to determine the basic addition facts to 18 (and related subtraction facts)

- Use and describe a personal strategy for determining a given sum
- Record equalities using the equal symbol

Grade 2

- Demonstrate an understanding of addition (limited to 1 and 2-digit numerals) with answers to 100 (and the corresponding subtraction) by:
  - Explaining that the order in which numbers are added does not affect the sum
- Apply mental mathematics strategies, such as
  - Using doubles
  - Making 10
  - One more, one less

- Two more, two less
- Building on a known double
- (Addition for subtraction)

to determine basic addition facts to 18 (and related subtraction facts)

❖ Construct and interpret concrete graphs (and pictographs) to solve problems.

Grade 3

❖ Demonstrate an understanding of addition (and subtraction) of numbers with answers to 1000 (limited to 1, 2 and 3-digit numerals) by:

- o Using personal strategies for adding (and subtracting) with and without the support of manipulatives
- o Creating and solving problems in contexts that involve addition (and subtraction) of numbers concretely, pictorially, and symbolically

❖ Apply mental mathematics strategies and number properties, such as

- o Using doubles ((e.g. for 4+6, think 5+5)
- o Doubles plus one (e.g., for 4+5, think 4+4+1)
- o Double take away one (e.g., for 4+5, think 5+5-1)
- o Doubles plus two (e.g., for 4+6, think 4+4+2)
- o Doubles take away two (e.g., for 4+6, think 6+6+2))
- o Making 10 (e.g., for 6+5, think 6+4+1)
- o Using the commutative property (e.g., for 3+6, think 6+3)

to recall basic addition facts to 18 (and related subtraction facts)

❖ Collect first-hand data and organize it using: o Tally marks

- o Line plots
- o Charts
- o Lists

to answer questions.

❖ Construct, label and interpret bar graphs to solve problems

Grade 5

❖ Describe the likelihood of a single outcome occurring using words, such as:

- o Impossible
- o Possible
- o Certain

❖ Compare the likelihood of two possible outcomes occurring using words, such as:

- o Less likely
- o Equally likely
- o More likely.

Grade 6

❖ Demonstrate an understanding of probability by:

- o Identifying all possible outcomes of a probability experiment
- o Differentiating between experimental and theoretical probability
- o Determining the theoretical probability of outcomes in a probability experiment
- o Determining the experimental probability of outcomes in a probability experiment
- o Comparing experimental results with the theoretical probability for an experiment.

Grade 7

❖ Express probabilities as ratios, fractions and percents.

❖ Identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving two independent events.

❖ Conduct a probability experiment to compare the theoretical probability (determined using a tree diagram, table or another graphic organizer) and experimental probability of two independent events.

Grade 8
❖ Demonstrate an understanding of percents greater than or equal to 0%
❖ Solve problems involving the probability of independent events.

Grade 9
❖ Demonstrate an understanding of rational numbers by
    o comparing and ordering rational numbers
    o solving problems that involve arithmetic operations on rational numbers
❖ Demonstrate an understanding of the role of probability in society

Foundations of Mathematics Grade 11 (2011 Implementation)
❖ Analyze and prove conjectures using inductive and deductive reasoning.
❖ Demonstrate an understanding of normal distribution, including:
    o standard deviation
    o z-scores

Workplace & Apprenticeship Grade 12
❖ Analyze and interpret problems that involve probability.

Foundations of Mathematics Grade 12
❖ Analyze puzzles and games that involve numerical and logical reasoning, using problem-solving strategies.

If necessary, how could this game be adapted for the students in your classroom?

- **Moose Tracks** (The game sheets are in the math games journal.)

<u>Curriculum Connections for "Moose Tracks"</u>

❖ Please refer to the curriculum connections for "MOOSE."

Before playing the game consider question number one.
Record the groups predictions.
Play the game but get them to record their addition sentence on each pair of tracks.

If necessary, how could this game be adapted for the students in your classroom?

- **Moose Nim** (The game sheets are in the math games journal.)

Curriculum Connections for "Moose Nim"

Apprenticeship and Workplace Mathematics 12 (2012 Implementation)

❖ Analyze puzzles and games that involve logical reasoning, using problem-solving strategies.

If necessary, how could this game be adapted for the students in your classroom?

If time permits, create a Nim Games Mini-Book (3D Graphic Organizer).

- **Six Moose** (The game sheets are in the math games journal.)

Curriculum Connections for "Six Moose"

Grade 2

❖ Demonstrate an understanding of addition (limited to 1 and 2-digit numerals) with answers to 100 (and the corresponding subtraction) by:
  - o Explaining that the order in which numbers are added does not affect the sum

❖ Apply mental mathematics strategies, such as
  - o Using doubles
  - o Making 10
  - o One more, one less
  - o Two more, two less
  - o Building on a known double
  - o (Addition for subtraction)

to determine basic addition facts to 18 (and related subtraction facts)

If necessary, how could this game be adapted for the students in your classroom?

- **“If You Give A Moose A Muffin” - Wild Tic-Tac-Toe**

Curriculum Connections for “If You Give A Moose A Muffin - Wild Tic-Tac-Toe”

Workplace & Apprenticeship Grade 10
❖ Analyze puzzles and games that involve spatial reasoning, using problem-solving strategies.

- **Moose Farkel**

Grades 3 and up or ages 8 and up
Also known as 10 000, "Zilch", "Chicken", "Pig", or just "the dice game".
Moose Farkel purchasing information can be found @ http://www.pocketfarkel.com/howtobuy.html. The telephone number is 1-316-733-7630. (The toll free number on the site does not work from Canada.)

Grade 4
❖ Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3 and 4-digit numerals) by:
- o using personal strategies for adding and subtracting
- o estimating sums and differences
- o solving problems involving addition and subtraction.

Grade 5
❖ Describe the likelihood of a single outcome occurring using words, such as:
- o Impossible
- o Possible
- o Certain

❖ Compare the likelihood of two possible outcomes occurring using words, such as:
- o Less likely
- o Equally likely
- o More likely.

Grade 6
❖ Demonstrate an understanding of probability by:
- o Identifying all possible outcomes of a probability experiment
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- o Determining the theoretical probability of outcomes in a probability experiment

- o Determining the experimental probability of outcomes in a probability experiment
- o Comparing experimental results with the theoretical probability for an experiment.

Grade 7

- ❖ Express probabilities as ratios, fractions and percents.
- ❖ Identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving two independent events.
- ❖ Conduct a probability experiment to compare the theoretical probability (determined using a tree diagram, table or another graphic organizer) and experimental probability of two independent events.

Grade 8

- ❖ Demonstrate an understanding of percents greater than or equal to 0%
- ❖ Solve problems involving the probability of independent events.

Grade 9

- ❖ Demonstrate an understanding of the role of probability in society

Workplace & Apprenticeship Grade 12

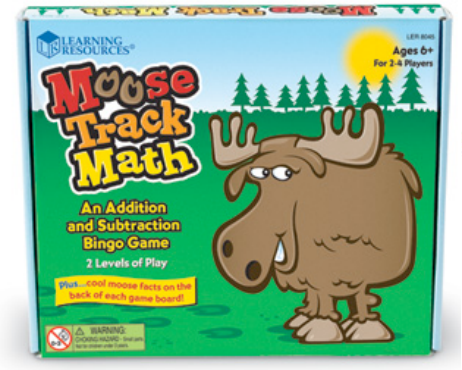
- ❖ Analyze and interpret problems that involve probability.

Foundations of Mathematics Grade 12

- ❖ Analyze puzzles and games that involve numerical and logical reasoning, using problem-solving strategies.

If necessary, how could this game be adapted for the students in your classroom?

- **Moose Track Math: An Addition and Subtraction Bingo Game**
  - Moose Lineup
  - Moose on the Loose



Moose and math are on the loose in a wild twist on a familiar game.
Provides a quick and easy family play opportunity

- Features moose facts on the reverse side of bingo boards
- Focuses on addition and subtraction with numbers 1–18
- Includes 4 double-sided game boards, 2 number dice, 1 operations die, 36 game markers and Activity Guide
- For 2-4 players

This game can be ordered from Learning Resources @ http://www.learningresources.com/product/shop+by+grade+level/grade+3/moose+track+math+bingo.do?search=basic&keyword=moose&sortby=bestSellers&page=1&#

Curriculum Connections For "Moose Track Math: An Addition and Subtraction Bingo Game"

Grade 1

❖ Demonstrate an understanding of counting by:
  - o Indicating that the last number said identifies "how many"
  - o Using the counting on strategy
  - o Using parts or equal groups to count sets

❖ Demonstrate an understanding of addition of numbers with answers to 20 (and their corresponding subtraction facts), concretely, pictorially, and symbolically by
  - o Using familiar and mathematical language to describe additive (and subtractive actions) from their experience
  - o Creating and solving problems in context that involve addition (and subtraction)
  - o Modeling addition (and subtraction) using a variety of concrete and visual representations, and recording the process symbolically

❖ Describe and use mental mathematics strategies (memorization not intended), such as
  - o Counting on (and counting back)
  - o Making ten
  - o Doubles
  - o (Using addition to subtract)

to determine the basic addition facts to 18 (and related subtraction facts)

- Use and describe a personal strategy for determining a given sum
- Record equalities using the equal symbol

Grade 2

- Apply mental mathematics strategies, such as
    - Using doubles
    - Making 10
    - One more, one less
    - Two more, two less
    - Building on a known double
    - (Addition for subtraction)

to determine basic addition facts to 18 (and related subtraction facts)

If necessary, how could this game be adapted for the students in your classroom?

- **Bullwinkle Math**

The numbers you show on your fingers are Bullwinkle's antlers.

Activity: Show me . . .

• Show me . . . a number up to ten. Ask the students to show you the same number in a different way too. (Say the number or hold up a card with the numeral written on it.)

• Show me . . . put two students (moose) together and have them show you any number up to 20 without talking. They can just look at each others antlers.

- Show me . . . put three students (moose) together and have them show you any number up to 30 without talking. They can just look at each others antlers.

Activity Variation

Instead of identifying or showing a certain number on the antlers. Have students show:

- One more?
- One less?
- Two more?
- Two less?
- The double?
- The double plus one more?
- How many more does it take to make 10?
- etc.

Curriculum Connections for "Bullwinkle Math"

Kindergarten

- Recognize, at a glance, and name familiar arrangements of 1 to 5 objects or dots.
- Relate a numeral, 1 to 10, to its respective quantity.
- Represent and describe numbers 2 to 10, concretely and pictorially
- Compare quantities, 1 to 10, using one-to-one correspondence.

Grade 1

- Recognize, at a glance, and name familiar arrangements of 1 to 10 objects or dots.
- Demonstrate an understanding of counting by:
    - Indicating that the last number said identifies "how many"
    - Using the counting on strategy
    - Using parts or equal groups to count sets
- Demonstrate an understanding of addition of numbers with answers to 20 (and their corresponding subtraction facts), concretely, pictorially, and symbolically by

- Using familiar and mathematical language to describe additive (and subtractive actions) from their experience
- Creating and solving problems in context that involve addition (and subtraction)
- Modeling addition (and subtraction) using a variety of concrete and visual representations, and recording the process symbolically

❖ Describe and use mental mathematics strategies (memorization not intended), such as
- Counting on (and counting back)
- Making ten
- Doubles
- (Using addition to subtract)

to determine the basic addition facts to 18 (and related subtraction facts)

❖ Use and describe a personal strategy for determining a given sum

❖ Record equalities using the equal symbol

Grade 2

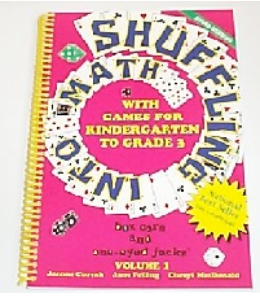
❖ Demonstrate an understanding of addition (limited to 1 and 2-digit numerals) with answers to 100 (and the corresponding subtraction) by:
- Explaining that the order in which numbers are added does not affect the sum

❖ Apply mental mathematics strategies, such as
- Using doubles
- Making 10
- One more, one less
- Two more, two less
- Building on a known double
- (Addition for subtraction)

to determine basic addition facts to 18 (and related subtraction facts)

If necessary, how could this game be adapted for the students in your classroom?

- **Further Resources Recommendations**
  - Box Cars & One-Eyed Jacks @ http://www.boxcarsandoneeyedjacks.com/.



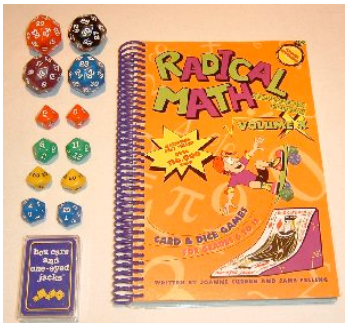
Shuffling Into Math With Games

(B-01) $23.95 The book is divided into six sections with 108 games for counting, patterning, numeration, addition and subtraction, multiplication and division. Each game is presented with appropriate grade level (K-3), specific math skills, number of players, rules, instructions, and variations to increase or decrease difficulty. Click Here to view a sample game! (Buy a class set of cards and 6-sided dice from the dollar store too.)

All Hands On Deck Math Games Using Cards and Dice Grades 1-9

(B-02) $23.95
Includes 113 math games using cards and dice. Games focus on all the operations, place value, decimals, positive and negative integers, graphing, and co-operative games. Specific math skills (Grades 1-9), number of players, rules, instructions, and variations to increase or decrease difficulty are included. Click Here to view a sample game. (Buy a class set of cards from the dollar store too. Consider buying a class set of dice too. There is more information below.)

Radical Math Card & Dice Games For Grades 6-12



(B-10) $36.95 CAN./U.S.
Contains 100 games that use cards, regular dice and special dice. Games focus on integers, decimals, place value, number systems and order of operation, linear equations, exponents, polynomials, coordinate geometry, trigonometry, quadratic functions and equations, graphing, and probability. Comes with 12 multi-sided dice (2 x 10, 12, 20, dice and 4 x 30-sided). (Buy a class set of cards from the dollar store too. Consider buying a class set of dice too. There is more information below.)

Fun "DIE" Mentals Grades 4-9 Dice Kit

(KT-14) $59.95 Comes in a carrying case with some great game ideas!

Box Cars & One-Eyed Jacks also has a math games archive on Education World @ http://www.educationworld.com/a_lesson/archives/boxcars.shtml.

- Yukon Education Mathematics Wikis

www.yukon-education-mathematics.wikispaces.com
http://yukon-education-mathematics.wikispaces.com/Online+Resources
www.yukon-ed-math-kindergarten.wikispaces.com
www.yukon-education-math-grade-1.wikispaces.com
www.yukon-education-math-grade-2.wikispaces.com
www.yukon-education-math-grade-3.wikispaces.com
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www.yukon-education-math-grade-9.wikispaces.com
www.yukon-education-math-grade-10.wikispaces.com
www.yukon-education-math-grade-11.wikispaces.com
www.yukon-education-math-grade-12.wikispaces.com
www.yukon-education-calculus.wikispaces.com

- Check out the media button on your Pearson Math Makes Sense DVDs (grades three to seven) too. The "See It Videos" show a class playing the games in each unit. *Let's check one out together to make sure that you know where to find them.)*

Moose Mathematics Games Journal
Table of Contents

Game #	Name	Skills
8	Bullwinkle Math	Addition Subtraction Recognize familiar arrangements of objects Relate a numeral to its respective quantity Compare quantities

Game #: ___

MOOSE

Skills: Addition, probability

Equipment: 2 6-sided dice, pencil & game board

Rules: One person is the roller.
5 rounds are played. (The M, O, O, S, and E round.)
All players stand.
After each roll, each player must write down the dice sum on the game board and decide to sit and keep the points or stand and stay in the round.
A round ends when all players are seated or a 1 is rolled.
If a 1 is rolled and a player is still standing then all points in that round are lost.
If moose eyes are rolled (2 1s) and a player is still standing then all points in that round and the previous rounds are lost.
The player with the most points wins.

This game was adapted by Ms. Paula Thompson, Yukon Education from the game of Skunk that can be found @ http://illuminations.nctm.org/LessonDetail.aspx?id=L248.

MOOSE Game Board

M	O	O	S	E

M	O	O	S	E

This game was adapted by Ms. Paula Thompson, Yukon Education from the game of Skunk that can be found @ http://illuminations.nctm.org/LessonDetail.aspx?id=L248.

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MOOSE Game Board

M	O	O	S	E

M	O	O	S	E

This game was adapted by Ms. Paula Thompson, Yukon Education from the game of Skunk that can be found @ http://illuminations.nctm.org/LessonDetail.aspx?id=L248.

"MOOSE" Thought Provokers

Instructions: Discuss and answer the questions that are assigned to your group.

1. Complete the chart and determine your average for five rounds.

Round	Best Possible Score	My Score	Fraction	Percent
1				
2				
3				
4				
5				

2. Consider your fractions from question one.

a. Sort your fractions into three groups. The three groups are close to zero, close to $\frac{1}{2}$, and close to 1. Explain how you sorted your fractions.

_____
_____
_____
_____
_____
_____

b. For those fractions that are close to $\frac{1}{2}$, decide if the fraction is more or less than $\frac{1}{2}$. Explain your reasoning.

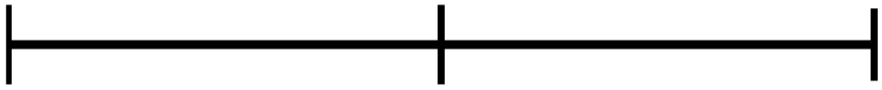
This game was adapted by Ms. Paula Thompson, Yukon Education from the game of Skunk that can be found @ http://illuminations.nctm.org/LessonDetail.aspx?id=L248.

c. Which of your fractions is closest to 1? Explain your reasoning.

d. Which of your fractions is closest to 0? Explain your reasoning.

e. Which of your fractions is closest to $\frac{1}{2}$? Explain your reasoning.

f. Put your fractions in order from least to greatest. Label 0, $\frac{1}{2}$, and 1 on the number line. Indicate approximately where each of your fractions belongs on the number line.



This game was adapted by Ms. Paula Thompson, Yukon Education from the game of Skunk that can be found @ http://illuminations.nctm.org/LessonDetail.aspx?id=L248.

Explain how you decided on the order of the fractions on the number line.

3. "MOOSE" is a game that involves both choice and chance.

a. What part of "MOOSE" involves choice?

b. What part of the game involves chance?

4. List some other games you know.

a. Which games involve mostly choice?

b. Which games involve mostly chance?

Rate each game on a scale of 1 to 10 with 1 meaning "pure chance," 5 meaning "chance and choice about equal," and 10 meaning "pure choice."

5. In life many things happen. Some are the result mostly of chance or "luck," and others mostly result from choices or

decisions you make. Think about some things that happened recently in your life.

a. List two things that happened to you mainly because of chance.

_____
_____
_____

b. List two things that happened mostly because you made a choice.

_____
_____
_____

6. Rolling a "one" in "MOOSE" is a disaster. To get a better score it would be useful to know, on average, how many good rolls happen in a row before a "one" or "double ones" come up.

a. Decide a way to find out. Explain your way.

_____
_____
_____

b. Carry out your plan and describe the results.

_____
_____
_____

7. In "MOOSE," when a "one" does not come up, what is the average score on a single roll of a pair of dice?

a. Decide on a way to answer this question.

_____
_____
_____

b. Carry out your plan and describe the results.

_____
_____
_____

8. What are some strategies that could be used to play "MOOSE"?

This game was adapted by Ms. Paula Thompson, Yukon Education from the game of Skunk that can be found @ http://illuminations.nctm.org/LessonDetail.aspx?id=L248.

a. Describe a play-it-safe strategy.

b. Describe a risky strategy.

c. Estimate the kind of scores each strategy would be likely to produce.

d. Play "MOOSE" using each of your strategies and keep a record of your scores.

e. How well do your results agree with what you expected?

This game was adapted by Ms. Paula Thompson, Yukon Education from the game of Skunk that can be found @ http://illuminations.nctm.org/LessonDetail.aspx?id=L248.

Game #: ___

Moose Tracks Game Sheet

Skills: Probablility, Addition

Players: One player or two players (one could roll and the other could move the counters.)

Equipment: Moose Tracks Game Board, 11 counters & 2 regular 1-6 dice.

Rules:
Place counters on the squares numbered 2 to 12. These are the moose.

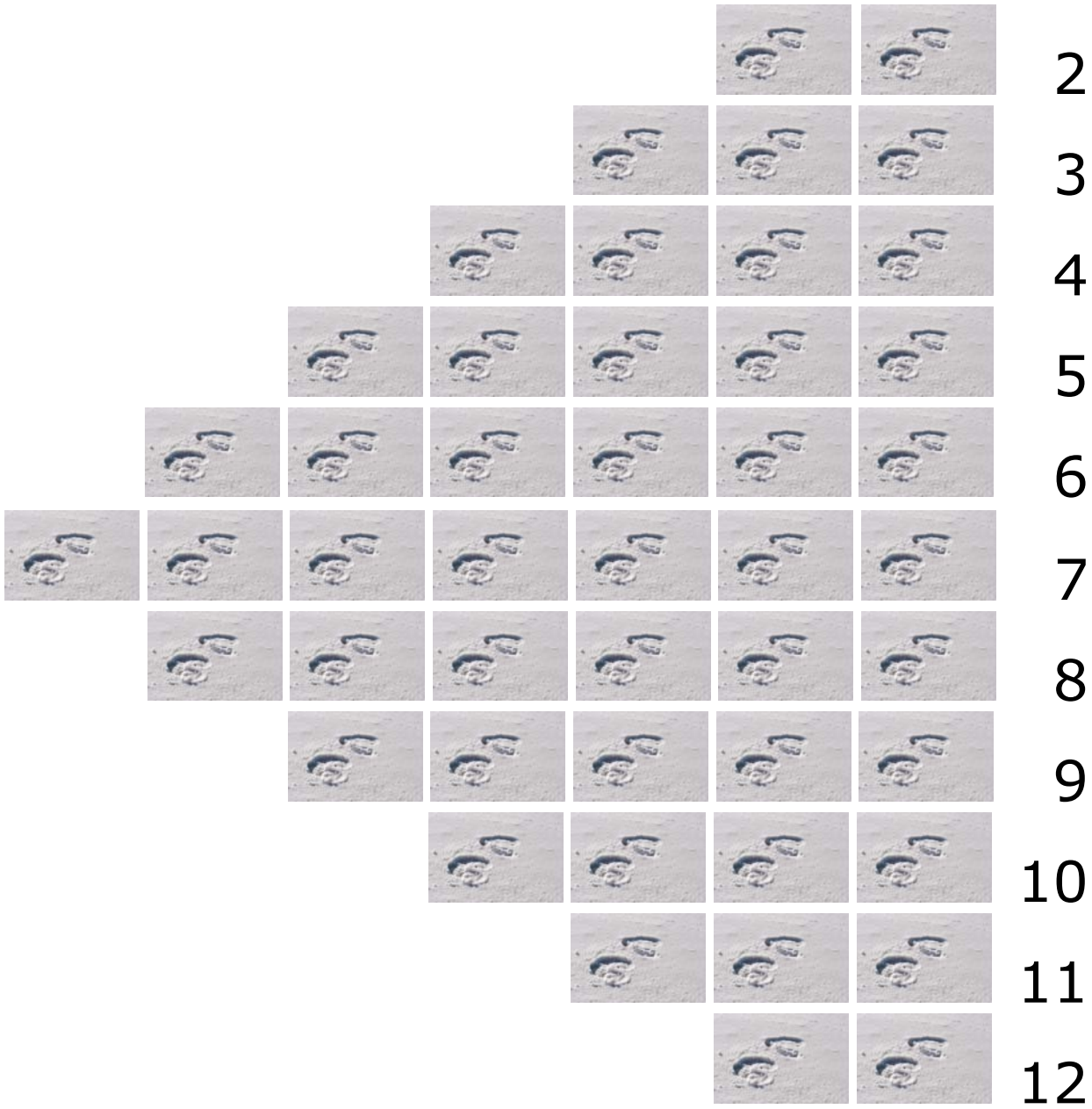
Roll two dice and add to decide which moose steps forward one space to the left.

Now throw the dice again and repeat this, each time moving the moose on that "row" on space to the left.

The moose that reaches the last space wins.

This game sheet was created by Ms. Paula Thompson, Yukon Education and was based on "Tricky Track" that can be found @ http://nrich.maths.org/2150.

Moose Tracks Game Board



This game board was created by Ms. Paula Thompson, Yukon Education and was based on “Tricky Track” that can be found @ http://nrich.maths.org/2150.

Moose Tracks Thought Provoking Questions

1. Which numbered moose do you think will get to the last space in the "row" first? Why?

2. Which moose won?

_____

_____

_____

   a. Is this what you would expect?

_____

_____

_____

   b. Play a few more times a make note of which moose reaches the end of its row first.

_____

_____

_____

   c. Can you explain these results?

_____

_____

_____

3. Is "Moose Tracks" a fair game? Explain.

_____

_____

_____

_____

_____

These questions were created by Ms. Paula Thompson, Yukon Education and were based on "Tricky Track" that can be found @ http://nrich.maths.org/2150.

Game #: ___

Moose Nim Game Sheet

Skills: Logical reasoning, analyzing games

Equipment: 9 counters and the game board or 9 toy moose.

Rules:

This is a game for two players.
Set up the nine moose (or place nine counters on the pictures) as shown on the game board.
Players take turns taking any number of moose in the same row.
The player that takes the last moose loses.

This game sheet was created by Ms. Paula Thompson, Yukon Education and it was adapted from Wolf Nim that can be found @ http://www.galileo.org/math/puzzles/pdf/WolfNim.pdf.

Moose Nim Game Board







This game board was created by Ms. Paula Thompson, Yukon Education and it was adapted from Wolf Nim that can be found @ http://www.galileo.org/math/puzzles/pdf/WolfNim.pdf.

Moose Nim Thought Provoking Questions

1. Which moose should the first player take in order to make sure of winning?

This question page was created by Ms. Paula Thompson, Yukon Education and it was adapted from Wolf Nim that can be found @ http://www.galileo.org/math/puzzles/pdf/WolfNim.pdf.

Game: _____

Six Moose Game Sheet

Skills: Division, multiplication, addition and subtraction of whole numbers.

Equipment: A deck of playing cards with Aces = 1 and the Jacks, Queens, Kings and Jokers are left out.

Rules:

This is a game for 2-6 players.

Choose a dealer. The dealer draws four cards from the top of the shuffled deck and lays them face-up on the table.

Use division, multiplication, addition and/or subtraction to create a mathematical sentence that equates to 24.

The first person to create a sentence says "Six Moose" and touches the first card in their sentence.

If after about 30 seconds nobody says "Six Moose" then the dealer removes the cards and replaces them.

If the player who says "Six Moose" makes a correct sentence, all the cards used in their sentence are kept and the dealer deals cards until four are face-up. If the player is incorrect, all the face-up cards are discarded. The game continues until the moment that the last card in the deck is drawn.

The player with the most cards at the end of the game is the winner.

Variations:

1. All four cards must be used in the sentence.
2. After 30 seconds, if nobody says "Six Moose" then add a card.
3. Aim for a different number of moose.
4. Use a different set of operators. For example, the concatenate operator, (+), gives the ability to graft numbers together so 1 (+) 5 (+) 8 = 158. You may also choose to permit brackets so that (3+1) x (5+1) = 24 is a sentence. Also try the square function "^2", or the exponent operator, "^", or using the factorial operator, "!". If you are adding new operators, you may wish to remove old ones.
5. Change the time limit.

This game sheet was created by Ms. Paula Thompson, Yukon Education and it was adapted from "Double Dozen" that can be found @ http://www.galileo.org/math/puzzles/DoubleDozen.html.

"Six Moose" Thought Provoking Questions

1. Why is this game called "Six Moose"?

2. What is the probability that the first two cards shown face-up allow for a correct sentence?

3. What is the probability that the two cards allow for a correct sentence if we renamed the "Three Moose"?

4. Children from Latvia, Estonia & Lithuania play three different versions of the game. In Latvia it is called "Dozen", in Estonia it is called "Twenty-One" and in Lithuania it is called "Double Dozen". Find four cards that can be made into sentences in all three versions.

This question sheet was created by Ms. Paula Thompson, Yukon Education and it was adapted from "Double Dozen" that can be found @ http://www.galileo.org/math/puzzles/DoubleDozen.html.

Game: _____

"If You Give A Moose A Muffin" Wild Tic-Tac-Toe Game Sheet

Skills: Logical reasoning, games analysis

Equipment:
Game Board
Game Pieces

Rules:

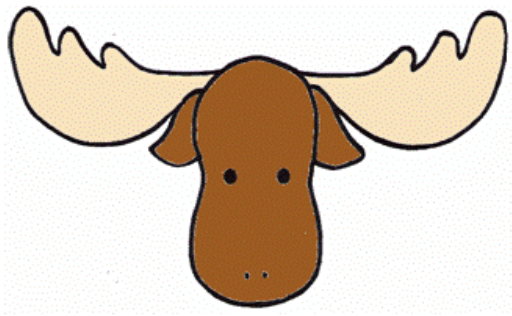
This game is the same as ordinary tic-tac-toe, except that on each turn a player can choose to play an X or an O. You win if you get three X's in a row, or three O's in a row.

Related Game:

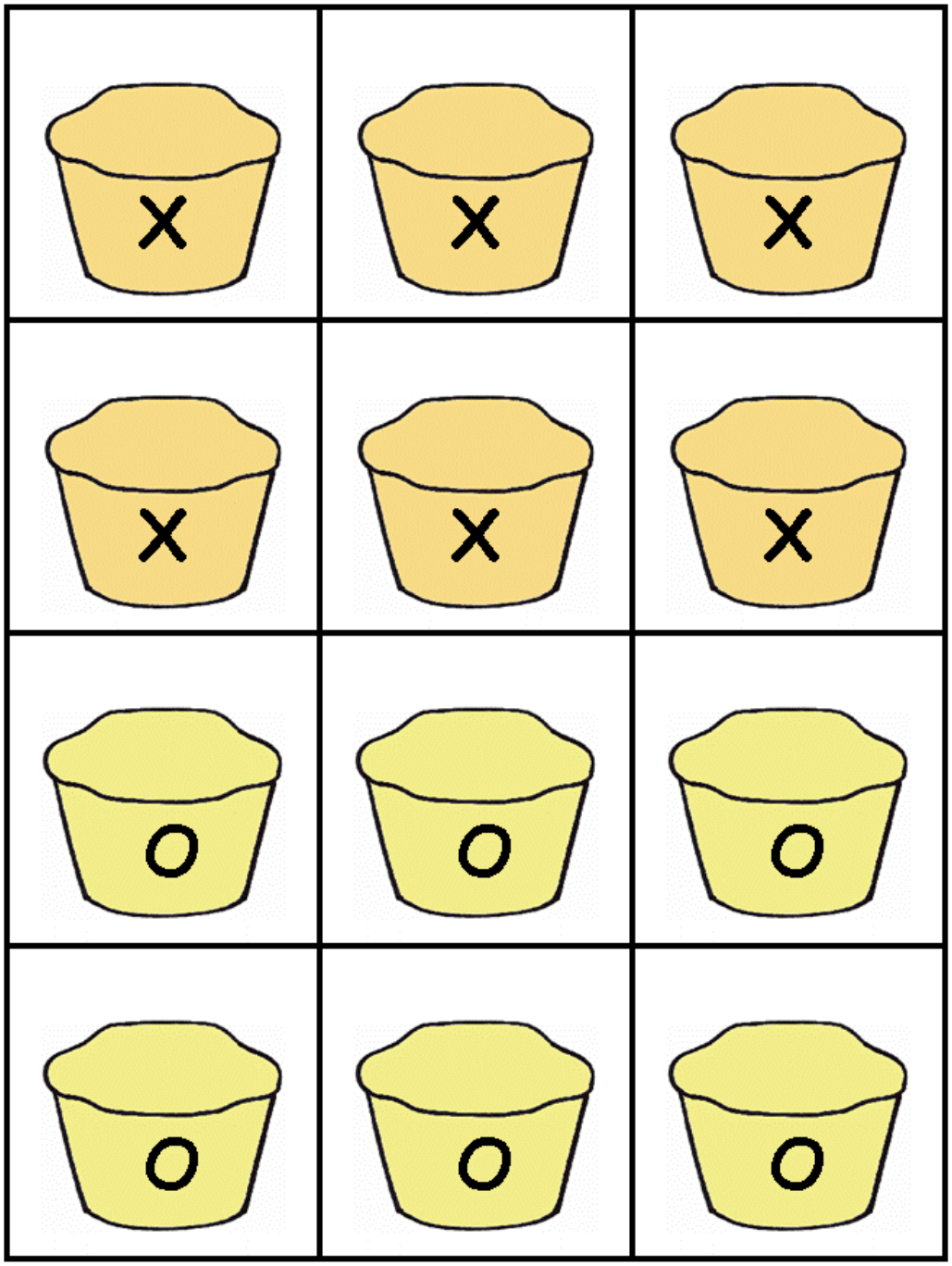
Same as the above game except that, after the first move, all placements must be made to a space beside the last space occupied. (If no such space exists, the game is a tie.) Example: the second player wins here:

This game was adapted by Ms. Paula Thompson, Yukon Education from Wild Tic-Tac-Toe that can be found @ http://www.galileo.org/math/puzzles.html.

Muffin Tic Tac Toe



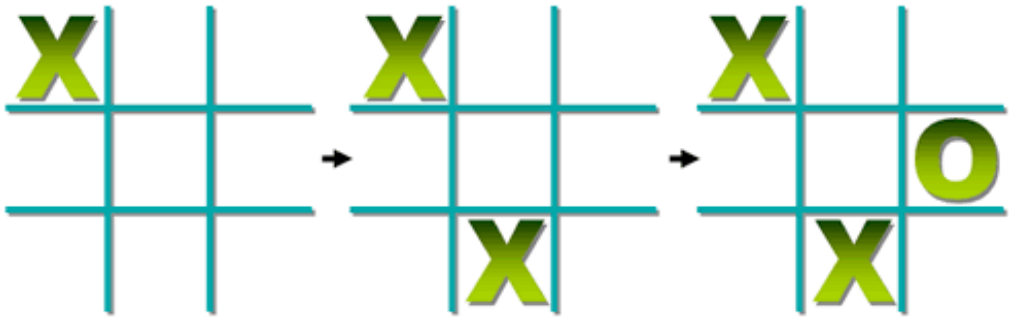
For more creative learning ideas check out
www.makinglearningfun.com



*****Directions-
Copy onto cardstock. Cut muffin cards apart. Laminate all of the pieces. Use to play tic tac toe.

If You Give A Moose A Muffin Wild Tic-Tac-Toe Thought Provoking Questions

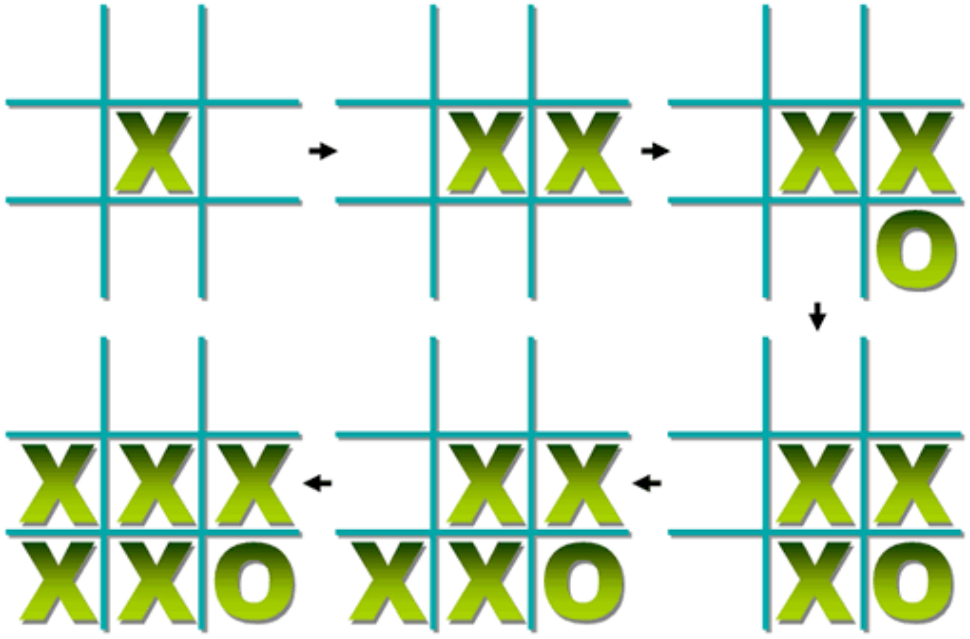
This game is the same as ordinary tic-tac-toe, except that on each turn a player can choose to play an X or an O. You win if you get three X's in a row, or three O's in a row.



1. What move or moves should the first player make so they always win?

Related Game:

Same as the above game except that, after the first move, all placements must be made to a space beside the last space occupied. (If no such space exists, the game is a tie.) Example: the second player wins here:



2. Is there a sure way for the first or second player to win?

This game was adapted by Ms. Paula Thompson, Yukon Education from Wild Tic-Tac-Toe that can be found @ http://www.galileo.org/math/puzzles.html.

Game #: _____

Moose Farkel

Skills: Addition
Probability

Players: Two or more

Equipment: Moose Farkel Game
Pencil
Paper for scoring

Rules: Moose are the same as a "one" on each die.

1. **Each player must get 500 points in one turn to get into the game.** First player rolls six dice and decides which dice they want to remove for score. Some scoring dice MUST be removed after each roll. See **SCORING** below. If they do not roll any MOOSE, FIVES, or some combination on any roll then their turn is over.
2. **ONLY MOOSE AND FIVES COUNT BY THEMSELVES**. All other dice will count ONLY in combinations . . .

SCORING COMBINATIONS	
MOOSE = 100 pts each	**FIVES = 50 pts each**
3 MOOSE = 300 pts	4 of a kind = 1000 pts
3 TWOS = 200 pts.	5 of a kind = 2000 pts
3 THREES = 300 pts	6 of a kind = 3000 pts
3 FOURS = 400 pts	3 PAIRS = 1500 pts
3 FIVES = 500 pts	2 TRIPLETS = 2500 pts
3 SIXES = 600 pts	1-6 STRAIGHT = 1500 pts
SCORING NOTE: FOUR-OF-A-KIND AND A PAIR = THREE PAIRS	

3. **Dice can only count for score once.** After dice are removed for score they are out of play and cannot be re-rolled or added to previously rolled dice to make a bigger score. However, if you can eventually make all six dice count for score in any number of rolls, you may pick them all up and keep rolling, adding to your score.
4. **Some dice must be removed after every roll.** You do not have to remove every scoring die but some score must come out every time you roll.
5. **Once you are in the game, you may continue rolling as long as you can roll points,** or stop at any time, take your score and pass the dice. However, if you roll no scoring dice, your turn is over, you must pass the dice and you lose any points rolled on that turn.
6. When one player reaches 10 000 or more points, all other players get one more turn to try to beat them. **HIGHEST SCORE OVER 10 000 WINS THE GAME.**

PLAYING THE HIGH STAKES VERSION

After all players are in the game, you may pick up any dice left unrolled by the previous player and roll those dice. If you roll any scoring dice, you receive the same score that the previous player rolled plus the points you have rolled. In High Stakes, stopping after you make all six dice count for score will leave all six dice eligible for the next player.

Moose Farkel Thought Provoking Questions

1) Moose Farkel is a game that involves both choice and chance.

   a) What part of "Moose Farkel" involves choice?

   _____
   _____
   _____
   _____
   _____

   b) What part of the game involves chance?

   _____
   _____
   _____
   _____
   _____

2) List some other games you know.

   _____
   _____
   _____
   _____
   _____

   a) Which games involve mostly choice?

   _____
   _____
   _____
   _____
   _____

   b) Which games involve mostly chance?

   _____
   _____
   _____
   _____

Rate each game on a scale of 1 to 10 with 1 meaning "pure chance," 5 meaning "chance and choice about equal," and 10 meaning "pure choice."

3) In life many things happen. Some are the result mostly of chance or "luck," and others mostly result from choices or decisions you make. Think about some things that happened recently in your life.

   a) List two things that happened to you mainly because of chance.

   _____
   _____
   _____
   _____
   _____

   b) List two things that happened mostly because you made a choice.

   _____
   _____
   _____
   _____
   _____

4) What are some strategies that could be used to play "Moose Farkel"?

   a) Describe a play-it-safe strategy.

   _____
   _____
   _____
   _____
   _____

b) Describe a risky strategy.

_____
_____
_____
_____
_____

c) Estimate the kind of scores each strategy would be likely to produce.

_____
_____
_____
_____
_____

d) Play “skunk” using each of your strategies and keep a record of your scores.

_____
_____
_____
_____
_____

e) How well do your results agree with what you expected?

_____
_____
_____
_____
_____

Game #: 7

Moose Track Math Bingo - Moose Linup or Moose on the Loose

Skills: Addition
Subtraction

Equipment: Moose Track Math Bingo Game which includes:
4 Double-Sided Game Boards
2 Number Cubes
1 Operational Cube
36 Game Markers
Activity Guide

Rules: Object of the Game
Be the first player to cover three squares in a row on your game board with the game markers!

Game Play

MOOSE LINEUP
Each player chooses a game board and takes nine markers.
They youngest player rolls the cubes.
Two numbers and either an addition or subtraction sign will show.
Add or subtract the numbers shown.
The player looks for that number on his or her board.
If the number is on the board, place one marker over that number.
Play continues to the left with each player rolling cubes and repeating these steps.
The first player to cover three squares in any direction wins!

Advanced Game Play

MOOSE ON THE LOOSE
Each player chooses a game board and takes nine markers.

This game can be ordered from Learning Resources @ http://www.learningresources.com/product/shop+by+grade+level/grade+3/moose+track+math+bingo.do?search=basic&keyword=moose&sortby=bestSellers&page=1&#

The youngest player rolls the cubes.
Two numbers and either an addition or subtraction sign will show.
Add or subtract the numbers shown.
The player looks for that number on his or her board.
If the number is on the board, place one marker over that number.
If a player rolls a 12, he or she must clear the board and start over.
If a player rolls an 11, the player to his or her left clears the board and starts over.
Play continues until one player covers all nine squares on a board and wins.

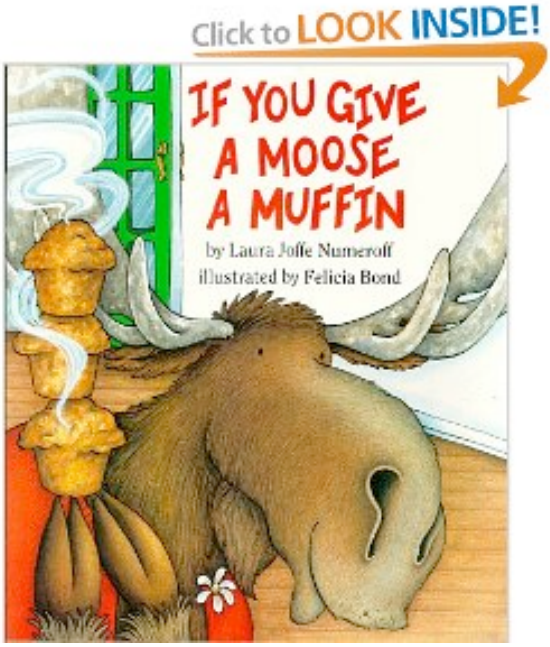
This game can be ordered from Learning Resources @ http://www.learningresources.com/product/shop+by+grade+level/grade+3/moose+track+math+bingo.do?search=basic&keyword=moose&sortby=bestSellers&page=1&#

Moose Track Math Bingo Thought Provoking Questions

1.

Using Children's Literature in Mathematics

- **If You Give a Moose a Muffin**



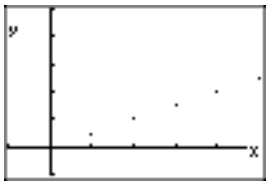
For today, some more moose math.

Gather some small blocks, lego, or rocks in a brown color to be the moose and another color or some muffin liners to be the muffins, about 10 of each and use a muffin pan (our muffin pan will be a ten frame), if you have one. If you give 1 moose 1 muffin (use one block of each colour side-by-side), how many muffins do you need for 2 moose? How about 3? Keep asking how many muffins are needed and encourage your students to provide the answer. This is called one-to-one correspondence and is a basic math concept.

Number of Moose, m	Number of Muffins, y
1	1
2	
3	
...	
m	

For more advanced math, make up some scenarios: these moose are really hungry and would like 2 muffins each. 1 moose needs 2 muffins.

Number of Moose, m	Number of Muffins, y
1	2
2	
3	
...	
m	

1. How many muffins would two moose need?
2. How many muffins would three moose need?
3. What patterns do you see in the table?
4. What's the pattern rule? (Start with ___ and jump by ___.)
5. How could you find out many muffins 12 moose would need?
6. How many moose are there if 100 muffins are needed?
7. Write a relation for the number of muffins needed for m moose.
8. The moose are getting hungrier. They would like three muffins each. Write an algebraic expression for this scenario.
9. Graph the data. Describe the graph.
10.  Write a moose scenario for this graph.
11. Create a question for your table partners to solve.

Check out your Math Makes Sense ProGuide too.

Activate Prior Learning

Ask questions such as:

- What does the table show? (The table shows the amount of muffins that are needed for different numbers of moose.)

- ✪ Why would you use a table to record data? (A table makes it easier to see patterns and predict results.)

Record the answers in the chart.

Elicit answers as there are different ways to answer many of the questions. For example, one way to answer some of the questions would be to extend the chart.

Ensure students recognize the relationships between the columns in the chart.

Assessment For Learning - Some Things To Look For

- ✪ Students can identify and describe a pattern found in a table.
- ✪ Students can analyze a number pattern and state the pattern rule.
- ✪ Students can describe and extend a pattern.
- ✪ Students understand that the points on a graph of a linear relation lie on a straight line.
- ✪ Students can describe and explain the patterns found on a graph of a linear relation.
- ✪ Students can write a linear relation to match a given graph.

What To Do If You Don't See It – Some Things To Do To Provide Extra Support

Students who have difficulty finding patterns may benefit from more specific questions. For example, ask, "Do you see a pattern in the number of moose column? How would you describe the pattern?

Students who cannot describe or extend a pattern may benefit from modeling the pattern with concrete materials or with drawings. For example, a block could be used to model each moose. Different coloured blocks could be used to model each muffin.

Other "If You Give A Moose A Muffin" Math Ideas

- From Making Learning Fun http://www.makinglearningfun.com/themepages/if_you_give_a_moose_a_muffin.htm **If You Give A Moose A Muffin Wild Tic-Tac-Toe** (The game sheets are in the math games journal.)

- Make the moose headband or make a moose finger puppet before doing the rhyme and have the students act it out. The printable pattern and rhyme can be found @ http://www.makinglearningfun.com/t.asp?b=m&t=http://www.makinglearningfun.com/Activities/moosemuffin/MooseHeadband.gif.

10 little muffins on the window sill.
Moose came along and ate his fill.
Now how many muffins are on the window sill?
(Do this in conjunction with ten frames too.)

- Make it with Art Supplies for Moose a Muffin Theme

Here is a recipe from "A Tahltan Cookbook Vol. 1: George & Grace Edzerza Family"

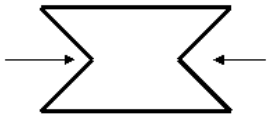
Quick & Simple Stew
Lori Edzerza
1-2 jars moose meat
2 carrots
1/2 onion
1-2 potatoes
1-2 stacks celery
Note: Can use frozen vegetables.
Cook veggies in a little water until tender. Add onion and meat last as the meat is already cooked. Make gravy and salad. Serve over rice.

Create a lesson for your table mates classes using the recipe and or art ideas.

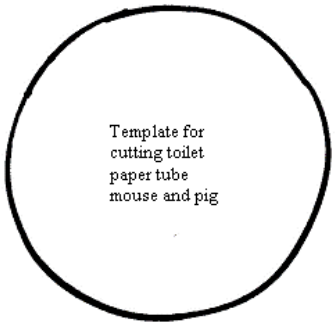
Toilet Paper Tube Puppets

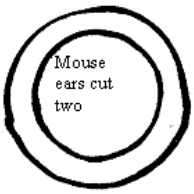
For the moose tube, flatten the tube. Then fold the top in as shown in the diagram. Then use the template below to round off the ends of the tube. After it is painted and dry. Put the ears and antlers where the arrows show. Glue the top closed and add wiggle eyes and a pompom nose.

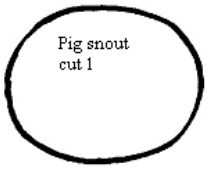
For the pig and the mouse, flatten the tube and cut it using the template below. Have the kids paint it. After it is dry, insert the pig ears into the top opening and glue it shut. Add the facial features. For the mouse, glue the top shut and then add the facial features.

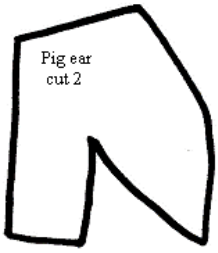


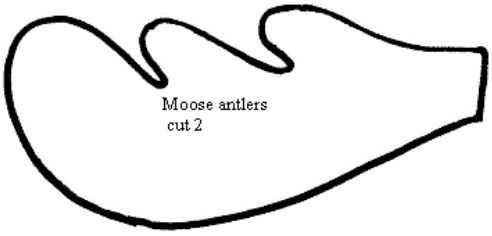
For more creative learning ideas check out
www.makinglearningfun.com

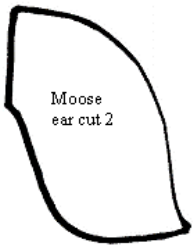




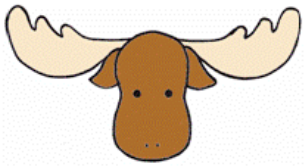








- [Recipes for Moose a Muffin Theme]



Apple Muffin Mix

To use:
Contents of jar, 1 egg, ¾ c. milk, ¼ c vegetable oil
Preheat the oven to 400 F. Stir all ingredients until just blended. Spoon batter into muffin liners, filling ¾ full. Bake 15 to 18 minutes.

This is a recipe for a jar mix. The kids fill the jar with the ingredients specified at the bottom. Tie the recipe card onto the jar. The children can give these as gifts or take them home and share them with their family. This is designed to be used with the book If You Give a Moose a Muffin.

Apple Muffin Mix

To use:
Contents of jar, 1 egg, ¾ c. milk, ¼ c vegetable oil
Preheat the oven to 400 F. Stir all ingredients until just blended. Spoon batter into muffin liners, filling ¾ full. Bake 15 to 18 minutes.

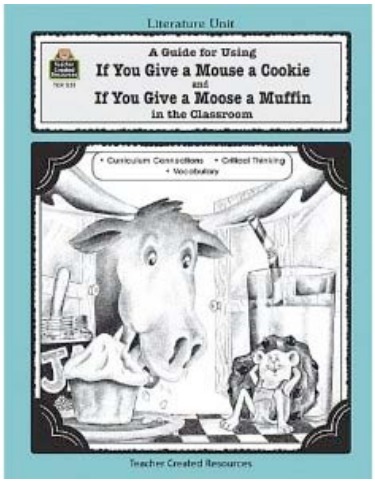
****Great for practicing measurement****

Using canning or large mayo jars have the children put the following ingredients into a jar: 2 cups flour, 2 t baking powder, ½ t salt, ½ c sugar, ¼ c brown sugar, 1 t cinnamon, ¼ t nutmeg and 1 c chopped dried apples.

Cut a circle of cardboard to cover the top. Cut a larger circle of fabric and put on top of that. Put the ring on the jar. Cover with a canning jar lid. Cut one recipe out and hole punch on the circle in the corner. Lace a ribbon through the hole and tie it to the jar.

- Check out the January 19, 2010 Hot Chocolate activity @ http://yukon-education-mathematics.wikispaces.com/Year+End+Report+August+2009+to+July+2010#Calendar%20of%20Events%20(Presentation%20Materials,%20Evaluation%20Forms,%20Etc.%20Are%20Included)-January for a similar that I did with the K-2 class in Faro, YT.

- Math Ideas for Moose a Muffin Theme
- http://www.amazon.ca/Guide-Using-Cookie-Muffin-Classroom/dp/1557345317/ref=sr_1_5?s=gateway&ie=UTF8&qid=1285805880&sr=8-5



- **Further Resource Recommendations**

    - **Marilyn Burns** - Free classroom lessons from Math Solutions (Marilyn Burns) @ http://www.mathsolutions.com/index.cfm?page=wp9&crid=56. Also, refer to her lessons chart @ http://www.mathsolutions.com/documents/lessons_chart-2.pdf.
    - Article: "Children's Literature: A Motivating Context to Explore Functions" from Mathematics Teaching in the Middle School, May 2005 (Volume 10, Number 9, Pages 470-478)
    - Paula Thompson - Mathematics & Children's Literature in Grades 9-12
    - Take any book that you like and google its name and math. What comes up?
    - Do a google image search and then check out the websites. For example, I did a google image search for math and moose and I got a lot of fun ideas.
    - **Bullwinkle Math Book**

        Consider taking pictures of your "moose" showing the numbers from one to ten and connect them with the corresponding counting words. (Please refer to the Bullwinkle Math game.)
        Here is a sample of a similar project (we just showed the numbers on our fingers . . . not with moose antlers.)
        Show Me Your Math! @ http://yukon-ed-show-me-your-math.wikispaces.com/Counting
        (Athapaskan Counting Book) Check out the Kaska Counting Book at this site.

Using Photographs in the Mathematics Classroom

I saw Ron Lancaster speak at an NCTM mathematics conference in St. Louis, Misourri. He edits “Mathematical Lens” in the NCTM journal Mathematics Teacher. “Mathematical Lens” uses photographs as a springboard for mathematical inquiry. The goal is to encourage readers to see patterns and relationships that they can think about and extend in a mathematically playful way. The second inspiration that I had for this project came when work brought be to Arviat, Nunavut. A missionary-type person in the town had a photography club up-and-running. Her goal was to help the kids in the town see the beauty that was all around them.

Photograph Math - Moose Word Problems

Yukon Government Photo

"Photograph Math" Word Problems - Consider trying out the lesson!

Here is another idea:

Consider having students right and/or post their own word problems using the moose photo and a piece of information from Environment Yukon to the Yukon Education Mathematics Blog.

Example (Grade 4-5)
In the southwest Yukon, between Teslin and Haines Junction, it is estimated that grizzlies kill more than 900 moose per year.

How many moose, between Teslin and Haines Junction, have been killed by grizzlies in your lifetime? Explain.

Curriculum Connections

Grade 4
A1 represent and describe whole numbers to 10 000, pictorially and symbolically

A3 demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3 and 4-digit numerals) by
- using personal strategies for adding and subtracting
- estimating sums and differences
- solving problems involving addition and subtraction

A5 describe and apply mental mathematics strategies, such as
- skip counting from a known fact
- using doubling or halving
- using doubling or halving and adding or subtracting one more group
- using patterns in the 9s facts
- using repeated doubling

to determine basic multiplication facts to 9x9 and related division facts

A6 demonstrate an understanding of multiplication (2- or 3-digit by 1-digit) to solve problems by
- using personal strategies for multiplication with and without concrete materials
- using arrays to represent multiplication
- connecting concrete representations to symbolic representations
- estimating products

Grade 5
A2 Use estimation strategies including
- front-end rounding
- compensation
- compatible numbers

in problem-solving contexts.

A3 Apply mental mathematics strategies and number properties, such as
- skip counting from a known fact
- using doubling of halving
- using patterns in the 9s facts
- using repeated doubling or halving

to determine answers for basic multiplication facts to 81 and related division facts.

A4 Apply mental mathematics strategies for multiplication, such as
- annexing then adding zero
- halving and doubling
- using the distributive property

A5 Demonstrate an understanding of multiplication (2-digit by 2-digit) to solve problems.

Some of my other photograph math postings:

- http://yukon-education-mathematics-blog.blogspot.com/2010/09/blog-post.html
- http://yukon-education-mathematics-blog.blogspot.com/2010/05/photograph-math-word-problems-consider.html
- http://yukon-education-mathematics-blog.blogspot.com/2010/05/3-d-object-cube-location-front-lawn.html

(Left) Moose track in the wet snow. Note the marks at the bottom of the print, are made by dewclaws. Dewclaws give extra support to the moose.

(Right) Birch Bark Moose Caller

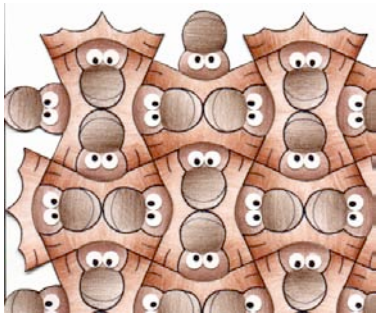


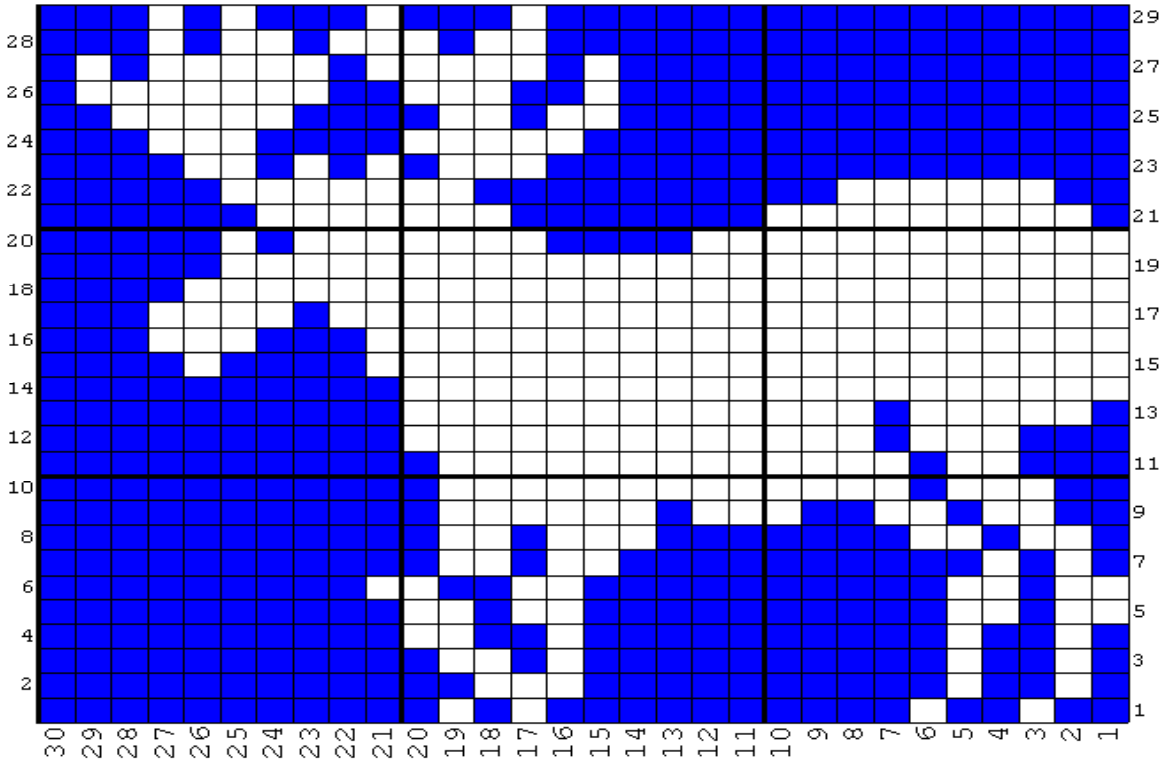
(Centre) Moose hair tufting on an Athabaskan beaded hide box, Fairbanks, Alaska

Another idea: Discuss with students the idea of balance and symmetry, its importance in Aboriginal life (i.e., for a healthy life, mind, body, and spirit must be in balance), and how this importance is reflected in Aboriginal artwork. Provide each student with a sheet of paper that contains half of an Aboriginal design to complete. Explore the Fort Nelson Aboriginal Project's Visual Arts Page to get a better understand balance and symmetry and its importance in Aboriginal life.

Other Mathematical Moose Ideas

- A Paper Moose - Robert J. Lang is a truly brilliant origami artist. He does it with math. His galleries are spectacular.
- From The Science Behind Algonquin's Animals - Teacher Resources - Moose Activities http://www.sbaa.ca/resources.asp?cn=391 It's All In The Teeth, David and Goliath (Brainworm), The Bigger, The Better, Population Census, Family Fued
- Moose Facts: http://www.smouse.force9.co.uk/facts.htm There is a lot of number-type information @ this site.
- Description: This horse-sized animal is the largest member of the deer family with long, dark brown hair, high, humped shoulders and long legs. A pendant of hair-covered skin sometimes reaching 2 feet hangs under the throat. Each April the male moose or bull grows a set of antlers reaching 120-150 cm which he loses in the winter after rutting season. Tracks - The moose track is slightly larger and more pointed than that of the elk and similar in shape to a deer's but twice as large. The track may be blunted if the ground is rocky and hard, making it more difficult to distinguish from the elks. A typical print is of two pointed pear shapes with the tips closer than the wider bottom. Straddle: 23 - 26 cm (9.2 - 10.4 in) Stride: 60 - 85 cm (24 - 34 in) Track: 16 cm (6.4 in) / 14 cm (5.6 in)
- http://www.canadiangeographic.ca/kids/animal-facts/moose.asp
- http://www.ankn.uaf.edu/curriculum/units/moose2.html
- http://www.ankn.uaf.edu/curriculum/units/StoryProblems/JesseThomasMooseHide.html
- http://www.ankn.uaf.edu/curriculum/units/moose.html



- Based off Escher's favorite pentagon tessellation, this would have been good even without the artist's talents. The eyes were cut out separately and glued onto each moose. Done on paper securely glued to poster board and then cut out along the edge for a finished look. http://euler.slu.edu/~clair/escher/student_tess/index.html
-  Hypotamoose from http://www.threadless.com/product/427/Hypotamoose?streetteam=tshirtgroove
- 

- http://www.sd79.bc.ca/programs/abed/Shared_Learnings_06.pdf
- http://rla.sd81.bc.ca/~fnap/moose/moose1.html
- http://rla.sd81.bc.ca/~fnap/mburke/mburke.html
- http://rla.sd81.bc.ca/~fnap/activities/mathactivity.html
- http://www.librarything.com/tag/moose

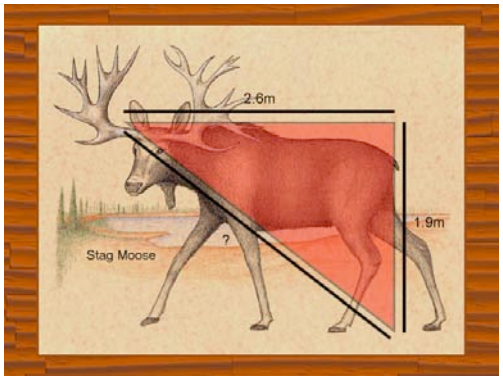
- This is a Moose:

With any mathematical problem we must define our formulas and provide our givens.

Here is what we're working with:

Formula for hypotenuse: Hypotenuse = the square root of the sum of each other side squared.
Average height of moose: 1.8m (smallest) - 2.1m (largest) = 1.9m average.
Average length of moose: 2.5m (smallest) - 2.7m (largest) = 2.6m average.

It's all falling into place on paper, but let's look at what we have. The following is our moose with our givens:



Now, let's apply our formula to our givens and find out the solution to our problem.

The Hypotenuse equals the square root of the sum of each other side squared.
Therefore the Hypotenuse = The square root of ($2.6\ m^2 + 1.9\ m^2$)
Therefore the Hypotenuse = The square root of (6.76 + 3.61)
Therefore the Hypotenuse = The square root of 10.37
Therefore the Hypotenuse = Approximately 3.2 m (rounded to the nearest tenth).

Congratulations, you have discovered, with the help of Billium McFiddlewiggles:

The Hypotenuse of a moose.

Billium McFiddlewiggles understands sizes and shapes of moose vary. This is merely an exercise based off average numbers.

Sources can be found here:

http://www.smouse.force9.co.uk/facts.htm - Length of Moose
http://en.wikipedia.org/wiki/Moose - Height of Moose

How is a moose really measured?

- Statistics & Probability:
  Who is the most fond of:
  Moose or another 4-legged animal
  Salmon or another fish
  Other

  Curriculum Connections
  At your grade level(s), what outcomes could this activity address?

LEARNING RESOURCES

LER 2241

3-D

A NEW DIMENSION IN PROBLEM SOLVING

Pentominoes

ACTIVITY BOOK

BASED ON NCTM STANDARDS

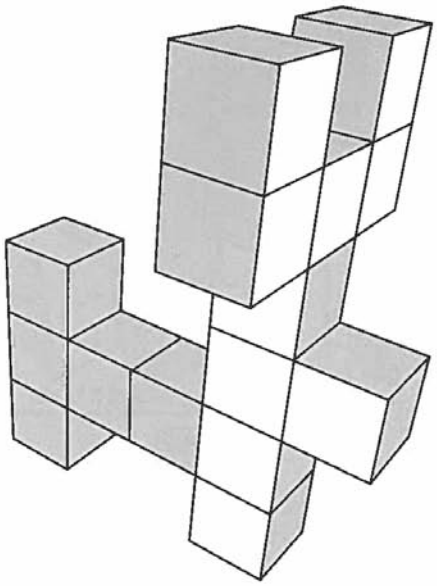
Grades 4-6

Ernestine H. Giesecke

Moose Crossing

This moose can be made with three pentominoes. Each of the pentominoes has a surface area of 22 square units.

Estimate the surface area of the moose. _____
Construct the moose and check your estimate.

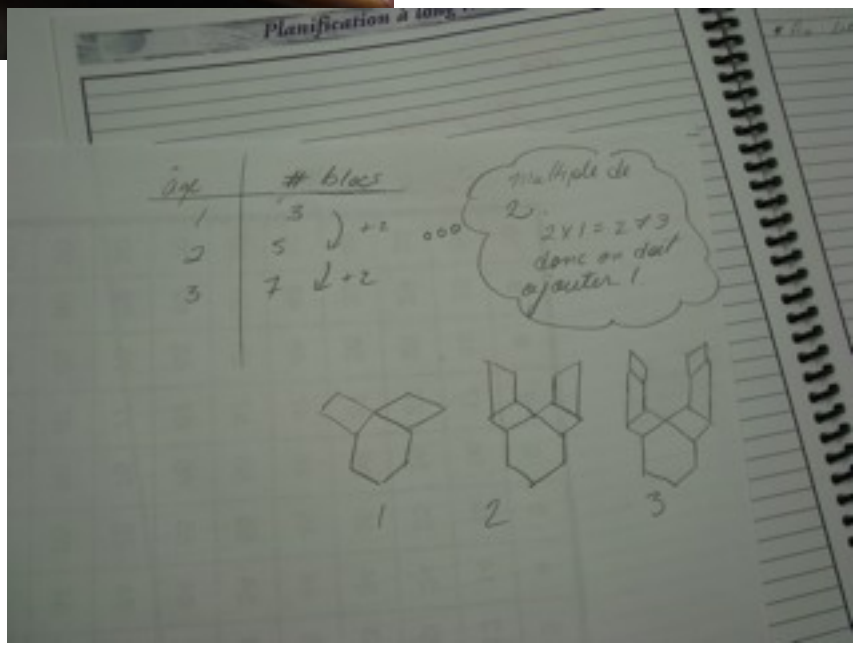


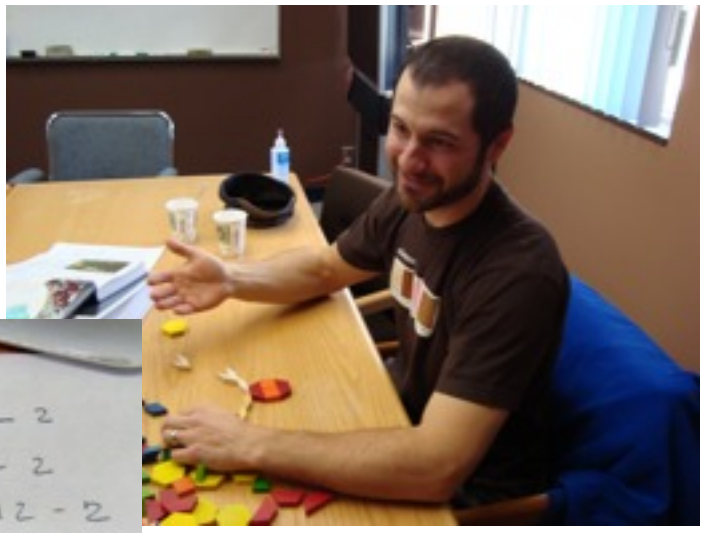
Actual Surface Area =

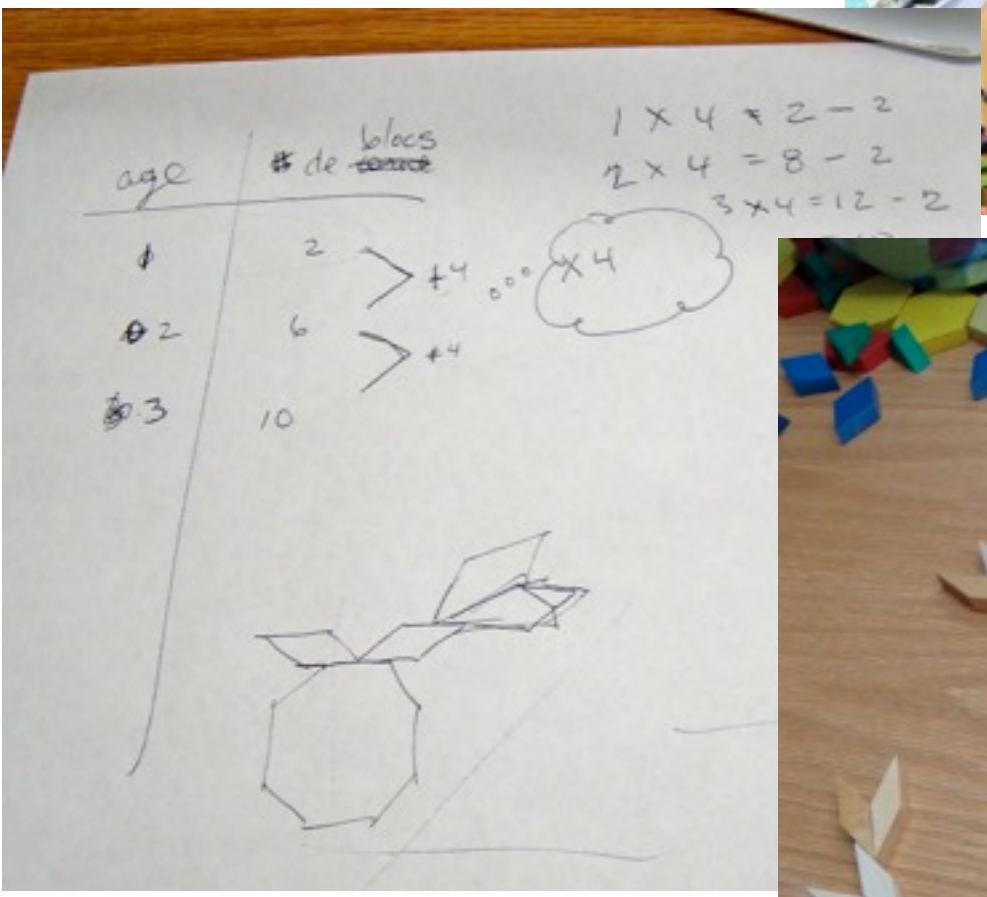
_____ square units

Growing Patterns With Moose Antlers

Growing patterns with moose antlers at a Mathématics 9e année in-service in 2010 . . .






age
de blocs
1
2
+4
2
6
+4
3
10
1 x 4 = 2 - 2
2 x 4 = 8 - 2
3 x 4 = 12 - 2
x4

SHARED Learnings

- **Patterns are important in Aboriginal technology, architecture and artwork.**
- **Aboriginal people used specific estimating and measuring techniques in daily life.**
- **Specific exchange items in traditional Aboriginal cultures had specific values.**

INSTRUCTIONAL STRATEGIES

Number Concepts

Using pictures of Aboriginal trade items (e.g., dentalium shells, dried fish or tools) with the values indicated on the back, have students play a trading game.

Use Aboriginal examples in word problems. Develop worksheets with Aboriginal motifs or objects that reflect local cultures. Counters may include local objects (e.g., pinecones, buttons, feathers, or clam shells).

Teach children to count to 10 in more than one language, including the local Aboriginal language or languages.

Patterns and Relations

Share examples of local Aboriginal art with the class. Ask students to notice patterns in the art work (e.g., multiples or mirrored images). Have students colour in an outline of an Aboriginal artwork using individual colours to identify shapes and patterns.

Have the students visit an Aboriginal-designed structure in the local community and have them examine the symmetry, balance, and patterns within the structure. Have students replicate simple models of the architecture focusing on the patterns they noted in the original.

Look at Aboriginal patterning in artwork and nature (e.g., basketweaving, wool weaving, moss growing on rocks). Have the children create repeated patterns while using objects relevant to local Aboriginal cultures.

Shape and Space

Invite a local Aboriginal Elder or knowledgeable community member to talk about traditional measuring and estimating techniques for hunting, fishing, and building. With the class, create a variety of related scenarios. For instance, an Aboriginal village has to determine how many fish or deer they need to catch to get them through the winter. What kinds of things must they consider to estimate the correct number? Students will need to think of the number of people, the size of the fish or deer, and how many fish or deer each person will need to eat.

Statistics and Probability

Have students interview their classmates to determine who is fond of what types of fish, or how many cousins each child has, or how many people live in their households. Have the children graph the findings.

DID YOU KNOW?

The number four is very important to many Aboriginal cultures; it relates to four seasons of the year, four cycles of life, four directions, four human gifts, four elements.

RESOURCES

- *First Nations Art Projects and Activities*

See Appendix H for a detailed description of this recommended resource and for a list of locally developed resources that have been created through partnerships between school districts and Aboriginal communities.

SHARED Learnings

- **Aboriginal peoples use unique counting systems.**
- **Aboriginal peoples used two- and three-dimensional patterns to build technology and shelters.**
- **Aboriginal peoples used the patterns and variables in the environment to make predictions and estimations.**
- **Math has functional use in solving problems in Aboriginal cultures.**
- **Aboriginal people value balance and symmetry.**

INSTRUCTIONAL STRATEGIES

Number Concepts

Discuss different names for numbers and point out that whatever a number is called, it still has the same value (e.g., 12 and dozen). Invite local Aboriginal language speakers to the classroom to teach the students the numbers 1 to 10 in the local Aboriginal language and to discuss name variations and the reasons for them.

Check with the local Aboriginal community to find out if their numbering system is a base 10 number system. Talk to students about different base forms of numbering systems.

Have the class prepare for a ceremony, either real or imaginary. Have them estimate quantities of food, supplies and associated costs.

Patterns and Relations

Discuss with students the idea of balance and symmetry and its importance in Aboriginal life. How is this importance reflected in Aboriginal art work? Provide each student with an edged sheet of paper that contains half of an Aboriginal design to complete.

Shape and Space

Have the students create two- and three-dimensional patterns after studying examples of traditional Aboriginal structures and technologies (e.g., trapper cabins, food caches, fish traps), then construct a model or replica.

Discuss with students patterns in the environment used by Aboriginal peoples (e.g., good or scarce hunting, rotation of trapping locations). Have students conduct independent research to find out how Aboriginal people used these patterns of variables (e.g., planning seasonal activity, estimating amounts).

RESOURCES

- *First Nations Art Projects and Activities*

See Appendix H for detailed descriptions of this recommended resource, and for a list of locally developed resources.

DID YOU KNOW?

The village of the Ouje Bougoumou Cree of Northern Quebec was designed by architect Douglas Cardinal in a circular design to reflect the values and culture of those people. (For more information, go to www.ouje.ca/content/our-story/innovation.php)

SHARED Learnings

- **Aboriginal people had functional and symbolic uses for geometry and numbers.**
- **Aboriginal people had specific concepts of time and space.**
- **Aboriginal people play games involving mathematical concepts**
- **Math as a total cultural expression is an important concept in Aboriginal cultures.**

INSTRUCTIONAL STRATEGIES

Problem Solving

- How many people would it take to move a 40' tree a distance of four or five miles?
- What needs to be considered when moving something that large and heavy?
- What different mechanical tools can be used, and how willl they help vary or distribute the weight?

Patterns and Relations

Ask students to examine various pieces of Aboriginal artwork or regalia for examples of parallels, balance, and symmetry. Invite an Aboriginal Elder from the local community to speak to the class about the importance of balance and symmetry in Aboriginal culture.

Develop templates and patterns for making birch bark baskets in one-quart or two-quart sizes. Develop patterns for baskets for holding irregular or heavy shapes, such as fish or stones.

Shape and Space

Invite into the classroom a local Aboriginal fisherperson who is familiar with traditional fishing practices, and ask this person to discuss with the class the use of geometry in traditional fishing.

Have the class examine the architecture of Douglas Cardinal (e.g., The Museum of Civilization in Hull, Quebec) and examples of Aboriginal architecture in the local community (e.g., tipis, pit houses, and longhouses). Focus on the use of geometry in Aboriginal design.

Statistics and Probability

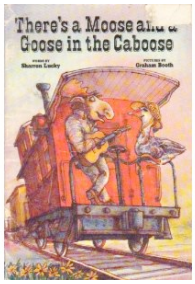
Invite a local Aboriginal Elder to teach students how to play the game of Lahal. Ask the Elder to talk about the use of probability, counting, guessing and prediction in the game and how it was used as a teaching tool to develop skills needed for traditional life.

Examine statistics available on the Ministry of Education website (www.bced.gov.bc.ca) that analyze graduation rates of First Nations students. What are the graduation rates within each School District? Identify what percentage of your school population is Aboriginal and analyze their graduation rates.

RESOURCES

See Appendix H for detailed descriptions of recommended resources and for a list of locally developed resources that have been created through partnerships between school districts and Aboriginal communities.

Other Moose Resources in the Yukon Education Teachers' Professional Library



Call #: BB 2832
Title: There's a Moose and a Goose in the Caboose
Summary: A moose and a goose enjoy a pleasant train ride until the conductor becomes aware of their presence.

Call #: VT 1163
Title: Four sequences of Yukon Indian Life
Grade: Grades K-12
Publisher: Council of Yukon Indians
Description: 1 videocassette (20 min.)
Contents: Four programs: Elders - Use of the Moose - Mary and Taylor - Yukon Indian Days

Call #: VT 4991
Title: Heaven's Pass
Grade: Grades 7-12
Publisher: [Lower Post, BC]: Heaven's Pass Productions, 2001.
Description: 1 videocassette (60 min.)
Note: "Produced with the participation of Telefilm Canada, Canadian Television. English and Kaska with English subtitles.
Summary: This video is the story of a unique place: The Muskwa Kechika. This 6.5 million hectare protected region located at the most northern tip of the North American Rocky Mountains and within the traditional homelands of the Kaska Dena aboriginal people. Today, this thriving ecosystem sustains the greatest diversity of wildlife in North America, including moose, stone sheep, caribou, bison, wolverine, grizzlies and other species. George MacDonald, a respected Kaska elder, and his extended family take viewers on a seasonal journey along traditional trails and rivers, using skills and knowledge gained from centuries of living on the land.
Subjects: Kaska Indians. First Nations -- Social life and customs, hunting and fishing. -- Lower Post, BC and Upper Liard River, YT

Call #: SP 0056
Title: Large animals of North America, group 2.
Grades: Grades K-9
Description: 8 prints 46 cm. x 33 cm., colour.
Summary: Views of moose, deer, bear, dallsheep, caribou, goat, and muskox.

Call #: TB 0039
Title: Moose.
Grades: Grades K-3
Description: Theme box: 44 student books, 5 teacher resources, 4 laminated photos.
Contents: Deneki: An Alaskan Moose, George's Hunting Trip, How To Tan Hides in the Native Way, A Literature Unit for If You Give a Mouse a Cookie & If You Give a Moose a Muffin, Little Brother Moose, Moose/ J. Ross, Moose on the Loose, Morris and Boris at the Circus, Morris the

Moose, Spruce the Moose Cuts Loose, Turk: The Moose, The White Moose, The White Moose: Activity Booklet, The White Moose: Teaching Guide -- Yukon moose folder [teacher resource].
Summary: This theme box is intended primarily for grades 1 to 3. The theme of moose is explored through picture books, chapter books, non-fiction, photographs, and teacher resources. Multiple copies of 8 titles make them suitable for buddy reading, guided reading groups, as well and independent reading. Seven titles have 3 to 12 copies.

Call #: VT 2143
Title: Native language, legend, history [NEDAA compilation]
Grades: Grades K-12
Publisher: NEDAA, 1989.
Description: 1 videocassette (22 min.)
Summary: Watson Lake Kaska language program - Han language lesson -Moose hunt - Tlingit salmon story - Part of the land, part of the water - Khoklux map.

Call #: VT 4328
Title: In the Company of Moose
Grades: 4-12
Publisher: Montreal, PQ: Multim dia
Description: 1 videocassette (45 min.)
Summary: This program documents wildlife painter Gis le Benoit's remarkable observations of the behaviour of moose in the wild and her unprecedented attempts to communicate with them.

Call #: SS 0004
Title: Moose Hunt on the St. Maurice
Grades: 7-9
Description: 20 slides, 1 guide.
Summary: Sketches made by one of a party of moose hunters in the late 19th century. From the Archives of Canada.

Call #: DVD 0067
Title: Wild Encounters, Volume III
ISBN: 1897064055
Grades: 6-12
Publisher: Kelowna, BC: Filmwest Associates, c2002.
Description: 1 DVD (50 min.)
Summary: Watch the largest member of the deer family, the moose, demonstrate it's adaptability to climate extremes and survival modes in the presence of predators.