Travelling Integers

Number of players	2 (or more)
Math Concepts	• Adding and subtracting integers
Materials	• Deck of cards with face cards removed • Number line (from -25 to 25) • Chips/pennies to mark players' places on the number line
How to Play	• Place both chips at 0 on the number line. • Player 1 picks a card. If it is red, player moves their chip down the number line. If it is black, player moves their chip up the number line. The exact number of spaces moved matches the number on the card. • Player 2 takes a turn. • Players alternate turns until one player wins. • A player wins by being the first to return to 0.
Discussion Questions	

Wipe Out

Number of players	2 (or more)
Math Concepts	• Equivalent fractions • Subtracting fractions
Materials	• Cuisenaire rods (for 2 players: 4 brown, many red, purple, white) • Spinner with these fractions written on: ½, ¼, 1/8
How to Play	• Each player starts with two wholes (2 browns) • Player #1 spins the spinner and then has three options: a) Remove a piece that has the same value as shown on the spinner (if you spin 1/2, you can remove a half or two quarters) b) Trade one of their pieces for something that is equivalent c) Pass d) • Then player #2 takes a turn • • The first player to lose all of their pieces wins
Variations	• Use different manipulatives to change the fractional value (e.g. two yellow hexagonal pattern blocks for a denominator of 12)
Discussion Questions	• Is this a game of luck or a game of strategy? • What was your strategy?

Tongta's Probability Game

Number of players	4 (two teams of two)
Math Concepts	• Probability
Materials	• Two strips of paper, divided into 7 boxes with numbers 0-6 written in boxes • Two 6-sided dice • 20 chips per team
How to Play	• Game starts with each team arranging their 20 chips on their papers (like gambling). All chips could be on one number, or they can be distributed any way the team wishes. • Team 1 rolls both dice and subtracts the two numbers. The answer will be a number between 0 and 5 and the team removes one chip from that number. • Team 2 goes. • First team to loose all chips wins
Variations	• Use ten-sided dice • Add the numbers • Team A places chips for Team B • Give team the option to add or subtract the numbers after they roll • Multiply the numbers
Discussion Questions	• How did you distribute your chips before the game started? • If you were to play the game again, would you distribute your chips differently? Why or why not?

*Note: Teams can work out the possible combinations for getting each number (example 0 is achieved by rolling doubles, 5 can only be achieved by rolling 6-1, etc.), see notes from EDCP 551 Ann's class for a detailed probability analysis)

Tongta's Dice Game

Number of players	4 (two teams of two)
Math Concepts	• Probability • Addition
Materials	• Score sheet • Ten 6-sided dice
How to Play	• Teams rolls dice and adds up sum, first team to reach a cumulative sum of 100 wins • Teams alternate rolling dice • Each turn, each team choose how many dice to roll (just 1, all ten, or somewhere in between) • BUT if a team rolls a 1, then their score for that whole round is 0
Variations	• Use fewer dice and lower the total score to win • Multiply the dice and increase the total score to win
Discussion Questions	• Is this a game of luck or strategy? • What was your strategy? • What is the probability of rolling a 1? • Does the probability of rolling 1 change based on whether you rolled a 1 on your last roll?

Quotient 500

Number of players	2
Math Concepts	• Division • Adding
Materials	• Score sheet/scrap paper • 4 dice (6-sided)
How to Play	• Player A rolls three dice and creates a three digit number by using the three numbers on the dice in any order. This is the dividend. • Player A rolls the fourth dice. This is the divisor. (If you roll a 1, roll again) • Player A works out the division, and the answer is their score for the round. • Then player B takes a turn. • First player to have their score reach 500 is the winner.
Variations	• Use 10-sided dice • Create a 4-digit number OR a 2-digit number (change the number of dice accordingly). • Player 1 rolls, player 2 arranges dice into 3-digit number, player 1 does the division and receives the score
Discussion Questions	• If you rolled 3, 5, and 8, what three-digit number would you choose for yourself? • If you rolled 3, 5, and 8, what three-digit number would you choose for yourself?

Pick a Pair – Adding & Multiplying

Number of players	2
Math Concepts	• Addition • Multiplication
Materials	• Three dice
How to Play	• Player A rolls all three dice • Player A picks two of the numbers and multiplies them together. Then player A adds the third number to the product. • This is player A's total for this round • Then player B takes a turn • Whoever has the higher total at the end of the round scores one point • Player with largest number of points at end of the round wins
Variations	• Use 10-sided dice • Try to get the lowest total for each round • Use five dice, create two two-digit numbers, multiply these together and then add the fifth number
Discussion Questions	

Pick a Pair – Multiplication & Exponents

Number of players	2
Math Concepts	• Multiplication • Exponents
Materials	• Three dice
How to Play	• Player A rolls all three dice • Player A picks two of the numbers and calculates one to the power of the other. Then player A multiplies the result by the third number. • Example: if you roll 4, 5, and 1, you can do 4^5 x 1 • This is player A's total for this round • Then player B takes a turn • Whoever has the higher total at the end of the round scores one point • Player with largest number of points at end of the round wins
Variations	• Use 10-sided dice • Try to get the lowest total for each round
Discussion Questions	

Powerful Products

Number of players	2
Math Concepts	• Multiplication of decimal numbers
Materials	• Three dice
How to Play	• Player A rolls all three dice (e.g. 5, 6, 4) • Player A uses two numbers on the dice to make a decimal number that has one digit in the ones place and one digit in the tenths place (e.g. 5.4) • Player A then multiplies their decimal number by the third number show on the dice (e.g 5.4 x 6) • Then player B takes a turn • The player with the larger product (answer when you multiply) at the end of the round scores one point • Then play another round • Player with the greatest score at the end of the time wins
Variations	• Player with the smallest product scores the point for the round
Discussion Questions	• Is this a game of luck or strategy? • What was your strategy?

Skemp's Rectangle Game

Number of players	2
Math Concepts	• Multiplication • Prime and composite numbers
Materials	• Counters
How to Play	• First, explain the definition of a rectangle being used for this game: a rectangle must have at least two rows and two columns (e.g. 1 x 7 is not a rectangle) • Player 1 takes a random handful of counters • Player 1 tries to arrange the counters into a rectangle • If player 1 can make a rectangle, they get a point • Player 2 takes a turn • Play another round (or many rounds) • THEN change the rules • Player 2 picks a number of counters for player 1 • If player 1 can make a rectangle, then player 1 gets a point • Player 1 picks a number of counters for player 2 If player 1 can make a rectangle, then player 1 gets a point • Continue taking turns until time is up
Variations	• Number of counters used must be between _____ and _____. • Eliminate 2 x ____ rectangles from the "definition" of a rectangle used in this game.
Discussion Questions	• What numbers were you able to make a rectangle with? What do you notice about these numbers? • What numbers were you not able to make a rectangle with? What do you notice about these numbers?

Race to 100

Number of players	Whole class game, students can work in pairs
Math Concepts	• Multiplication • Prime and composite numbers
Materials	• 100s chart (see attached) • 2 ten-sided dice
How to Play	• Students work with a partner to compete against all of the other groups in the class. • Players roll both dice and multiply the two numbers together to find the product. • Then they find the product on their hundreds chart and cross off / circle/ draw a heart around it. • The first group to cross off all numbers on the chart wins (students will quickly discover that this is impossible).
Variations	• Use 6-sided dice (max. product is then 36, so consider using a chart up to 40 instead of 100)
Discussion Questions	• By show of hands, who had circled 1? 2? 3? 4? 5?, etc. • Why did no one have 11 circled? • Look at another group's 100s chart. What numbers do you both not have circled? Why? • Why is it impossible to have 92 circled? (Largest number possible with 10-sided dice is 81 because 9x9 = 81). Can you make 92 by multiplying two numbers together? What about 93?

Names: _____

Race to 100

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

BEDMAS Battle

Number of players	2
Math Concepts	• Order of operations
Materials	• Recording sheet (see attached) • 4 dice
How to Play	• Player 1 rolls all four dice to generate four digits • Then player 1 creates an expression using all four numbers • The expression must contain at <u>most</u> one of the following: + - ÷ x ( ) • Player 1 then simplifies their expression to find their final number • Then player 2 repeats the same steps • They player with the larger final number wins a point for this round • Play until the one player reaches 5 points. This player is the winner.
Variations	• Include exponents • Allow two sets of brackets • Do not allow players to use one of the operations • The player with the smallest final number wins a point (this will change the strategy entirely)
Discussion Questions	• Which operation did you use the most? Why? • Which operation did you use the least? Why? • What was your strategy? • How did you use the brackets? • How would the game have been different if you were not allowed to use bracketS?

NAME: _____

BEDMAS Battle

Numbers on Dice	Expression	Final Number

Types of Triangles

Number of players	2
Math Concepts	• Triangle Types • Probability
Materials	• Three 6-sided dice • Paper for students to record work
How to Play	• Player 1 rolls all three dice to generate three numbers • These three numbers represent the side lengths of a triangle • Player 1 then determines whether the triangle is isosceles, equilateral, or scalene • Player 1 must record their triangle type on paper • Then player 2 takes at turn • The first player to roll four scalene triangles wins
Variations	• Use Cuisenaire rods as sides of triangles; have students actually build the triangles and further classify them as right, obtuse, or acute
Discussion Questions	• Which triangle was the most common type to roll? Why? • Which triangles was the most difficult to roll? Why? • Was this a game of luck or a game of strategy? Explain.

Angles and Triangles Hunt

Number of players	Small groups (3-4 students in a group is best)
Math Concepts	• Triangle Types • Identifying angles and estimating their size
Materials	• List of items to find (see attached) • Digital camera (one per group)
How to Play	• Teams are given a list of items to find (e.g. an object with 6 or more right angles) • When a team finds an item on a list, they take a photo • Each photo is worth one point (teams can take more than one photo of the same item) • Teams receive 15 bonus points if they get all the items on the list • Team with the greatest number of points at the end of the allotted time period wins
Variations	• Only allow one photo of each item on the list • First team back wins • Change items on list
Discussion Questions	• Which item was the most challenging to find? Why? • Which item was the easiest to find? Why?

ANGLES & TRIANGLES HUNT

Group Names_____

Each photo is worth one point. You may take more than one photo of each item, so long as the items are different. Any team, with photos of all the items listed below, will get 15 bonus points.

- ☐ An obtuse angle
- ☐ A quadrilateral with all sides > 3 m long
- ☐ An acute triangle
- ☐ An equilateral triangle
- ☐ An angle that is approximately 135°
- ☐ An angle that is approximately 270°
- ☐ An object with 6 or more right angles
- ☐ A school staff member making a 85° angle with their hands or arms
- ☐ All of your team members making a 60° angle
- ☐ An isosceles triangle
- ☐ A right triangle that has at least one side that is longer than 1 m
- ☐ A rectangular prism with at least one side that is shorter than 10 cm
- ☐ An acute angle
- ☐ An obtuse triangle
- ☐ An angle that is approximately 10°

Root Race

Number of players	Whole class; divide class into two teams
Math Concepts	• Simplifying or calculating square roots
Materials	• Two 10-digit dice (or dice on a smartboard) • Mini whiteboards & markers for students to work on their answers
How to Play	• Teacher rolls both dice to create a two-digit number and writes it under the root sign • Students then either calculate or simplify the square root of that number • The first team to calculate or simplify the root correctly wins
Variations	• Play in small groups instead of whole class
Discussion Questions	

Fraction Flip It

Number of players	2
Math Concepts	• Multiplying and dividing fractions • Comparing fractions
Materials	• Deck of cards
How to Play	• Player 1 draws four cards from the deck • Face cards = 10, ace = 1 • Player 1 arranges the four cards into two proper fractions and then multiplies them together • Player 2 then does the same • The player with the larger product receives a point • The first player to score 5 points wins
Variations	• Have players divide their fractions instead of multiplying them • Each player draws 6 cards and makes 3 fractions • When it is player 1's turn, he/she draws 4 cards and player 2 draws 4 cards. Player 1 makes two fractions as per usual and player 2 makes fractions. Player 1 must then multiply all 4 fractions together. • Player with the smallest product wins a point
Discussion Questions	• How would the game be different if you were allowed to create improper fractions? • What was your strategy? How did it change as the game progressed?