

MATHS GAMES with DICE for the SUMMER

Pig

Math Concepts: (Mental) Addition; Critical Thinking; Thinking Strategically; Probability of Rolling a 1 or two 1s

Goal: To be the first to score 100 points or more

Number of Players: Two or more

Materials: Two dice and paper to keep track of the score

How to Play:

Players take turns to roll two dice and find the sum while following these rules:

1. On a turn, a player may roll both dice as many times as he or she wants, keeping a running total of the sums that come up. When the player stops rolling, he or she records the total and adds it to the total from the previous rounds.
2. But, if a 1 comes up on one of the dice before the player decides to stop rolling, the player scores 0 for that round and it's the next player's turn.
3. Even worse, if a 1 comes up on both dice, not only does the turn end, but the player's entire accumulated total returns to 0.

Variations for *Pig*:

Computation: Students can add the score mentally, use paper pencil, 100 chart

Questions to Extend Thinking: How many more to 100? (add up to 100 mentally, paper pencil, 100 chart)

What strategy did you use to play? What made you decide to stop rolling? What made you decide to roll again? What is the theoretical probability that you will roll a 1? Or two 1s? What is the best way to play?

Going to Boston

Math Concepts: Greater Than/Less Than; Addition Facts or Multiplication Facts

Goal: To be the first to score 100 points or more

Number of Players: Two or more

Materials: Three dice and paper to keep track of the score

How to Play:

1. Have each player roll one die. The player with the highest number goes first.
2. Each player in turn rolls all three of the dice. After the first throw, remove the die with the highest number and put it aside.
3. Roll the two remaining dice and again put the highest number aside.
4. Roll the last die and add up the numbers on all three dice to get the player's score for that round. Record the score on a pad of paper.
5. Continue taking turns moving clockwise around the table until all players have had a turn. The highest score for the round wins.
6. Play a number of rounds and either add up a combined score at the end or tally winning rounds to come up with a game champion.

Variations for *Going to Boston*:

- Play with two dice for younger children to practice addition skills
- Keep the lowest numbered die rather than highest for a slightly easier game that practices addition skills
- Increase the number of dice in the game to 4+ to practice more complicated addition skills
- Practice multiplication facts by taking the sum of the first two dice and multiplying it by the third

Two-Dice Sums

Math Concepts: Addition Math Facts; Probability of the Sums of Rolling Two Dice

Goal: To remove all the counters in the fewest rolls possible **Number of Players:** Two or more

Materials: 11 counters (small objects- pennies/pebbles/shells), a game strip that lists the numbers from 2 to 12 spaced far enough apart so the counters can fit on top of each number, and a recording sheet.

How to Play:

1. Each player arranges 11 counters on the game strip and records the arrangement.
2. Once the counters are arranged, players take turns rolling the dice.
3. For each roll, all players can remove one counter if it is on the sum rolled. Players keep track of the number of rolls of the dice it takes to clear their game board.

Variations for *Two-Dice Sums*:

Students of all ages can play this game, as long as they're able to add the numbers that come up on two dice. While younger children benefit from the practice of adding, older students have the opportunity to think about the probability of the sums from rolling two dice.

Questions to Extend Thinking: Play the game several times and have a discussion about the different ways they arranged the counters and the number of rolls it took. *Which arrangements are best for removing counters?* Have them write about the arrangements that are best for removing the counters in the fewest number of rolls.

Which sum was rolled most often? Which sum was rolled least often? Why? List the combinations to make each sum. Find the theoretical probability and test it vs the experimental probability.

Math War Games with Dice

Practice addition, subtraction, multiplication and fractions

(see Math War Games with Cards for directions and variations)

Commercial Dice Games

Yahtzee This affordable classic dice game from Milton Bradley combines luck and strategy. Players practice sequencing, critical thinking skills, and addition and multiplication facts. The game can be purchased and score pads can be purchased separately.

Bunco A game entirely based on chance, rather than strategy, Bunco can provide a lot of educational fun for even very small children. The object of the game is to collect points for rolling certain combinations of dice. Keeping score can help to practice basic addition, and regularly calculating how many points are needed to reach the goal of 21 can be encouraged as a way to practice subtraction facts. Bunco rules can be found easily in an online search, or the boxed game including dice, score cards and complete rules can be purchased at many large retail stores.