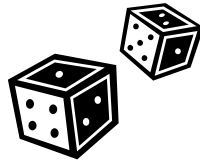
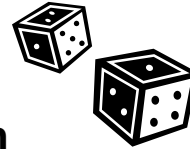


# EXPLORATIONS<sup>in</sup> Math

Helping Elementary Students Succeed in Math



## Dice Games = Math Fun



*One math manipulative that most of us have in our classroom is dice. This little cubed figure is our best friend when it comes to teaching multiple math concepts.*

**Dice games are versatile.** They can be based on luck, on skill, on planning, or all the above. You can find games to play with two players or twenty, on a table or on the floor, with 3-year olds and with 70-year olds!

**Dice games are educational.** They are educational in obvious ways, for example encouraging counting and numbers in little children and quick mental addition in older children. But they are also excellent at reinforcing the concept of taking turns, scoring (both mental and on paper), winning and losing gracefully, patience and so much more.

**Dice math games are simple and fun...**everyone loves rolling dice. Dice are small enough to take on trips or even when taking the kids out to eat etc. They are a great way to practice math skills and pass the time.

### More useful dice gaming tips:

- Use a cup to control shaking before the roll (this can be noisier but that is okay!).
- To prevent dice from falling to the floor, instruct students to cup one hand as if it were a soccer goal and roll the dice with the other hand into the “goal”.
- Use old place mats or felt squares to dampen the noise of dice rolling.
- Students often get overly excited about rolling dice, creating flying dice and theatrics. Use this rule to help keep gaming orderly: If dice are rolled off the mat, the **player loses his/her turn.**
- Put felt in the bottom of a box lid or basket to solve both issues at once!

**Pig: Mental Addition and Critical Thinking: Primary to Intermediate**

The goal of Pig is to be the first player to get to 100. The game is played with a pair of dice, and requires a paper and pencil for scoring.

- The first player rolls the dice, calculates the sum (mentally), and then rolls again if he or she wants to. The next sum is added to the first. The player can roll as often as he/she wants before handing dice over to player 2. However...
- If a 1 comes up on one of the dice before the player decides to stop rolling, the player scores 0 for that round. The play goes to the next player.
- Worse still, if a 1 comes up on both of the dice, the turn ends and the player's entire total falls to 0.

Lead a class discussion about strategies used in Pig and how opponents need to be able to use mental math to check that the roller is playing fairly. Be sure to instruct students to continue adding their score on their second and third turn from where they left off on the previous turn.

**PIG SCORESHEET** 

Record your score at the end of each turn. The first player to score 100 or more wins the game of PIG.

ROUND	PLAYER 1	PLAYER 2	ROUND	PLAYER 1	PLAYER 2
<b>1</b>			<b>6</b>		
<b>2</b>			<b>7</b>		
<b>3</b>			<b>8</b>		
<b>4</b>			<b>9</b>		
<b>5</b>			<b>10</b>		

**Going to Boston:** *Math Facts: Primary to Intermediate*

This game requires three dice and pencil & paper.

In one turn, the first player rolls all three dice. The highest roll is put aside. The next two dice are rolled and the highest number is put aside again. The last die is rolled, and then all three dice are added together.

The winner is whoever gets to a predetermined amount first, such as 100. Use a lower target for primary grades.

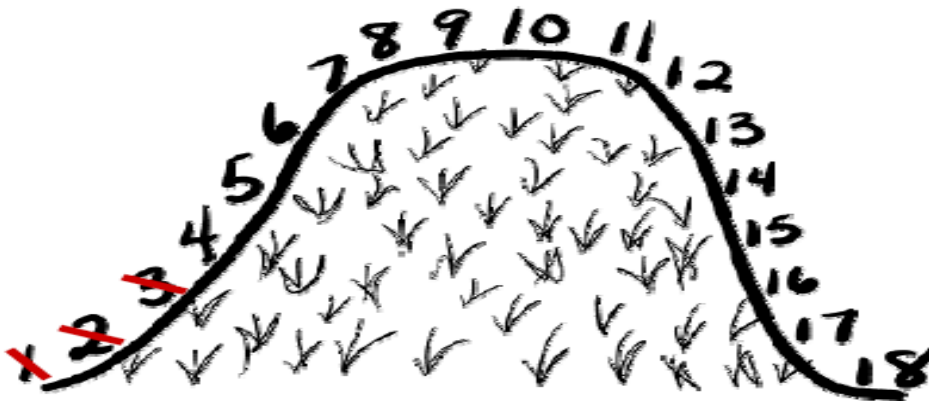
Variations on the game are adding the first two dice and multiplying the sum by the third; using any combination of addition, subtraction, multiplication or division to get the highest number possible, or just using two dice to practice basic math facts (addition, subtraction or multiplication).

**Over the Hill:** *Number Sense: Primary*

Group students into pairs; give each student and Over the Hill worksheet and each pair 3 dice.

Students will take turns rolling all 3 dice. They are to add or subtract the amounts shown on the rolled dice and then cross off those sums or differences on their "hill" number line. They must go in numerical order starting at 1 and will cross off as many as possible in that roll. When they cannot create any more numbers from the rolled dice, it is their partners turn.

Each player's turn starts at the end point from the previous turn. The first to reach 18 wins.



EXAMPLE: Player A rolls a 3,4,6. She can cross off 1 (because  $4-3 = \underline{1}$ ), 2 (because  $6-4 = \underline{2}$ ), and 3 (because  $6-3 = \underline{3}$ ) from her worksheet. She cannot make a sum or difference of 4, so now it is player B's turn to roll. Each player's turn starts at the end point from the previous turn. The first to reach 18 wins.

## OVER THE HILL

