Dice Activities for Math

Engage • Enrich • Empower

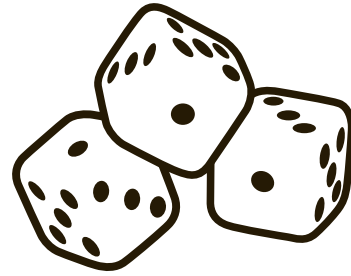**Mary Saltus, Karen Moore, Diane Neison, Marcia Fitzgerald and Chet Delani**

How to Play

- *Toss die. Highest goes first.*
- *Players take turns tossing die and moving their token that many boxes on the chart.*
- *Player must land exactly on 25 to win. First player to reach 25 wins.*

1	**2**	**3**	**4**	**5**
16	**17**	**18**	**19**	**6**
15	**24**	**25**	**20**	**7**
14	**23**	**22**	**21**	**8**
13	**12**	**11**	**10**	**9**

How to Play

- *Toss die. Highest goes first.*
- *Play begins on **25**.*
- *Players take turns tossing die and moving their token **backwards** that many boxes on the chart.*
- *Player must land exactly on **1** to win.*

25	**24**	**23**	**22**	**21**
10	**9**	**8**	**7**	**20**
11	**2**	**1**	**6**	**19**
12	**3**	**4**	**5**	**18**
13	**14**	**15**	**16**	**17**

Directions for Three-Dice Graph and Chart Activities

Objectives:

- Recognition of numerals 1 through 18
- Recognition of number patterns 1 through 18
- Recording of numerals 3 through 18
- Recognition of odd and even numbers

Materials

- 3 dice
- Numeral cards 1 through 18
- Graph and chart activities using three dice
- Tokens (tiles, cubes, chips)
- Pencils, markers, crayons

Warm-Up Activities

- Student tosses three dice, finds the sum of the dots on the dice, and responds verbally with the numeral name.
- Student tosses three dice and responds by showing the numeral card with the sum of the three dice.

NOTE how student arrives at the sum:

- Does the student count each dot?
- Does the student recognize the pattern on a die and continue counting from there?
- Does the student recognize the pattern combination with no indication of counting the dots? This is an indication that the student is conserving number.

Recording on Graphs

- Student tosses three dice and writes corresponding numeral for the sum of the dice above the corresponding numeral on the graph.
- If students have not been instructed on correct numeral formation, they can color in the boxes on the graph or place a token on a box to indicate that sum has been tossed.

- Activity is completed when one column of numerals is full.

NOTE

- Why is there no 1 or 2 on the three-dice graph?

Discussion

- What die pattern was tossed the most? The least?
- Is there a tie?
- Which number:

  has almost as many as _____?

  has the second most?

  has the second least?

  more than? less than? one more than? etc.

- Encourage the students to ask one another questions about the graphs.
- Make a large class graph and record daily class results of which die patterns occur the most (probability).

Chart Activities

- Each player chooses a color token.
- Players toss dice.
- Highest number goes first.
- Player tosses dice and performs operation (adds, subtracts, halves, and so on).
- Player finds the number on the chart and places a token on number.
- If number has a token on it, player loses a turn.
- Count the tokens to see who wins.

How to Play

- *Toss 3 dice. Find the sum.*
- *Find the sum on the chart.*
- *Place your color token on that number.*
- *Lose a turn if you cannot place a token on the chart.*
- *Player with the most tokens wins.*

8	**13**	**10**	**16**	**5**
9	**3**	**11**	**13**	**12**
10	**14**	**15**	**9**	**10**
13	**11**	**7**	**18**	**6**
9	**17**	**4**	**12**	**14**

Directions for Tens and Ones Activities

Objectives:

- Conceptualize sets of 10
- Add 10 to numbers 1 through 18
- Recognize number patterns when adding 10 to a number (unit numeral remains the same)
- Recognize number patterns when subtracting a number from a number ending in zero—for example, 20−3=17
- Develop a sense of number and number patterns 1 through 100

Materials
- 10–15 dice
- Red and white dice
- Tens/ones card
- Hundred Chart
- Graph and chart activities
- Tokens (tiles, cubes, chips)
- Pencils, markers, crayons

Warm-Up Activity: Dot on Die = 10
- Student tosses die, says how many dots.
- With each dot representing 10, student counts by tens to find out how many tens are represented by the die toss.

Warm-Up Activity: Grouping by 10
- Student tosses 10–15 dice.
- Student organizes dice in groups whose sum is 10—for example, 6, 4; 5, 5; 2, 3, 5; 2, 2, 6.
- Student counts the groups of 10 and adds the dice left over to find the value of the toss.

Discussion: Graph and Chart Activities
- What die pattern was tossed the most? The least?
- Is there a tie?

- Which number:

  has almost as many as _____?

  has the second most? has the second least?

  more than? less than? one more than? etc.
- Make a large class graph of the Die Plus Ten Chart and play the activity as a class. Discuss ways to find the total of each column.

Discussion: Place Value Addition and Subtraction, Handful of Dice
- Discuss ways to find the total of each of the three columns.
- Which column seems the easiest to total? Why?
- Which column seems the hardest? Why?
- What are different ways to find the total of the ones column?
- Add the Tens total to the Ones total. Why is this total the same as the total of all the sums?

Discussion: Two-Dice Switch
- What die pattern was tossed the most? The least?
- What are the most numerals that can be crossed off in a toss?
- What tosses result in no numerals being crossed off?
- What is the least number of numerals, aside from zero, that can be crossed off in a toss?
- What number combinations result in only two numerals being crossed off?
- What is the highest number that can be crossed off?
- What is the lowest number that can be crossed off?
- Are there any other numbers between 1 and 66 (besides 1) that cannot be crossed off?
- Is this a fair game? Explain.

Die Plus Ten Chart

- Each player chooses a color token (tiles, cubes, chips).
- Players toss die and add 10. Highest number goes first.

How to Play

- *Toss die and add 10 to the number.*
- *Find the sum on the chart and place a token on that number.*
- *If number has token on it, lose turn.*
- *Count tokens to see who wins.*

+10
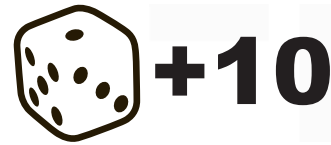
11	**12**	**13**	**14**	**15**
16	**11**	**15**	**13**	**16**
15	**16**	**11**	**12**	**13**
12	**11**	**12**	**16**	**11**
14	**15**	**13**	**15**	**14**
13	**14**	**16**	**15**	**12**

Dice Activities for Math

- Each player chooses a color token (tiles, cubes, chips).
- Players toss dice, find the sum, and add 10.
- Highest number goes first.

How to Play

- Toss two dice, find the sum, and add 10.
- Find the sum on the chart, and place a token on that number.
- If number has token on it, lose a turn.
- Count tokens to see who wins.

+10

12	**13**	**14**	**15**	**16**	**17**
18	**19**	**20**	**21**	**22**	**21**
20	**19**	**18**	**17**	**16**	**14**
13	**12**	**17**	**18**	**16**	**14**
19	**13**	**20**	**17**	**18**	**16**

- Each player chooses a color token (tiles, cubes, chips).
- Players toss 3 dice, find the sum, and add 10. Highest sum goes first.

How to Play

- *Toss 3 dice, find the sum, and add 10.*
- *Find the sum on the chart.*
- *Place a token on the sum.*
- *If sum has a token on it, lose a turn.*
- *Count tokens to see who wins.*

13	21	26	22	19	23
25	15	17	20	18	14
18	20	19	23	21	18
16	24	22	15	25	28
20	26	21	19	23	24
27	21	16	22	17	20

Dice Activities for Math

Objectives:

- Review number concepts developed through the graph and chart activities
- Practice computation
- Develop number sense
- Develop game strategy
- Develop communication and cooperation skills

Materials

- Dice
- Tic-Tac-Toe grids
- Tens/ones card
- Tokens (tiles, cubes, chips)
- Pencils, markers

Warm-Up Activity: Tic-Tac-Toe

- Make an overhead of one of the activities or sketch it on the board. Play against the class, following the directions.
- Player chooses an X or O.
- Players toss die. Highest number goes first.
- Player tosses die or dice and computes answer.
- Player finds the new number on the grid and places an X or O on it.
- If the number has a token on it, player loses a turn.
- Player winning 2 out of 3 games wins.

Discussion

- Is this a game of luck or skill? Why?
- What numbers do you need to toss to win?
- Which number was tossed the most?
- Which number was tossed the least?

Warm-Up Activity: 4-Grid Tic-Tac-Toe

- Make an overhead of one of the 4-Grid Tic-Tac-Toe activities. Play the game against the class, following the directions.
- Player chooses an X or O.
- Players toss die. Highest number goes first.
- Player tosses die or dice and computes the answer.
- Player finds the new number on any of the grids and places a token on it.
- If the number is not available on any of the grids, player loses a turn.
- When no more winning plays are possible on any of the grids, players count their Tic-Tac-Toe scores (3 tokens in a row) to find the winner.

Discussion

- What are the most possible Tic-Tac-Toes you can get on one of the grids?
- Which strategy works best—trying to get the most 3 tokens in a row or trying to block your opponent from getting 3 in a row?

Die Plus One Tic-Tac-Toe

- Each player chooses a color token (tiles, cubes, chips).
- Players each toss die. Highest number goes first.

- *Toss die.*
- *Add one to the number of dots on the die.*
- *Player finds the new number on the grid and places a token on it.*
- *If number has a token on it, lose a turn.*
- *First player to get three in a row wins that game.*
- *Play 3 games. Player winning 2 out of 3 games wins.*

5	**2**	**3**
4	**6**	**7**
7	**2**	**4**

Die Plus Two Tic-Tac-Toe

- Each player chooses a color token (tiles, cubes, chips).
- Players each toss die. Highest number goes first.

How to Play

- *Toss die.*
- *Add two to the number of dots on the die.*
- *Player finds the new number on the grid and places a token on it.*
- *If number has a token on it, lose a turn.*
- *First player to get three in a row wins that game.*
- *Play 3 games. Player winning 2 out of 3 games wins.*

5	**8**	**3**
4	**6**	**7**
7	**8**	**4**

Dice Activities for Math

Double the Die Tic-Tac-Toe

- Each player chooses a color token (tiles, cubes, chips).
- Players each toss die. Highest number goes first.

How to Play

- *Toss die.*
- *Double the number of dots on the die.*
- *Player finds the new number on the grid and places a token on it.*
- *If number has a token on it, lose a turn.*
- *First player to get three in a row wins that game.*
- *Play 3 games. Player winning 2 out of 3 games wins.*

10	**2**	**12**
6	**4**	**8**
10	**8**	**6**

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Half-Die Tic-Tac-Toe

- Each player chooses a color token (tiles, cubes, chips).
- Players each toss die. Highest number goes first.

How to Play

- *Toss die.*
- *Find one-half of the number of dots on the die.*
- *Player finds the new number on the grid and places a token on it.*
- *If number has a token on it, lose a turn.*
- *First player to get three in a row wins that game.*
- *Play 3 games. Player winning 2 out of 3 games wins.*

$\frac{1}{2}$	$2\frac{1}{2}$	**3**
$1\frac{1}{2}$	**1**	**2**
$2\frac{1}{2}$	**3**	$1\frac{1}{2}$

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