Teaching Ideas

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Show Down

Objectives: Given cards with the answers to the basic facts of a given operation, the student will match one answer at a time to the problem by covering the correct square.

Variation: Play the game with partners. Players take turns turning over a card and covering square.

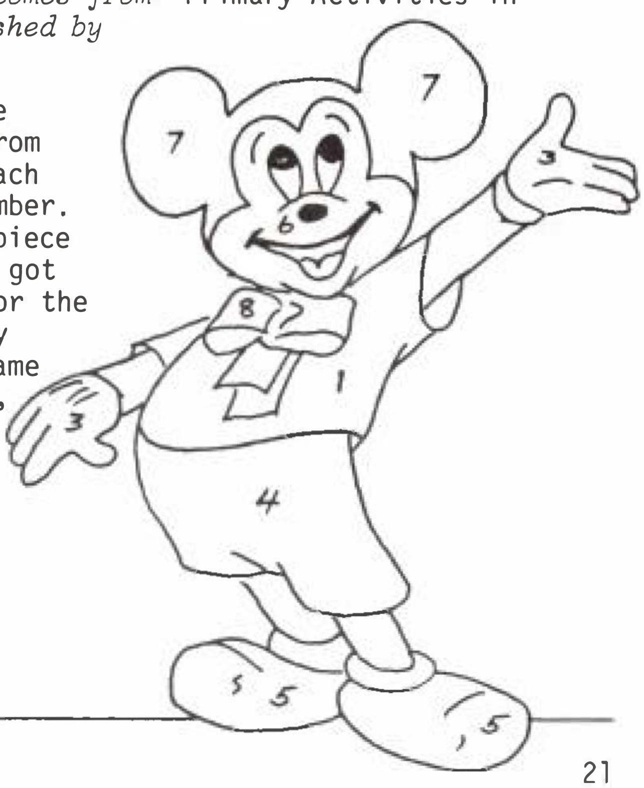
Materials: A playing board with 56 squares (8 rows of 7 squares); each square contains a basic fact of a given operation. Two sets of 56 cards - on each card is written an answer to match each fact on the board. (The operation of basic facts and the size of the game board can be varied.)

Procedure: Two players face each other on opposite sides of the game board. Each takes a set of cards and turns them face down. At an agreed time both begin turning over cards and covering the square to match the answer. (Only one card can be turned at a time.) If a player cannot find a place for a card, he puts it in a discard pile, then turns up another card. Play continues until the board is covered or both players have no cards left. The player with the greatest number of squares covered is the winner.

Mickey Mouse

This primary number recognition activity comes from Primary Activities in Mathematics *by Dr. Donald Buckeye; published by Midwest Publications.*

The game is played with two or more people. Cut out a body of Mickey Mouse from cardboard and cut it into pieces. Have each piece of the body labelled a different number. The student rolls the dice and takes the piece of body which has the same number that he got on the dice. The object of the game is for the student to put together the body of Mickey Mouse. The first to do this wins. The game can also be played by subtracting, adding, multiplying and dividing the numbers on the dice.



Divide Mickey into several pieces: ears, head, bowtie, hands, body, pants, shoes, and so on. Give each piece a different number.

Beetles

This first-year math game is sent to us by Wendy Both of Canyon Meadows Elementary School.

Use a die among 4 players. Take it in turns to throw the die. You must throw a 6 to begin (draw the body). To this you can add 2s (for legs) and 1 for the tail. You need a 5 for the head before you can add 3s (feelers) or 4s (eyes).

When a player has completed (drawn) a beetle, he calls "Beetle!" Everyone stops, counts the number of parts of the beetle drawn, and writes his total in the "score" column.

Start game #2. When nine games have been completed, add the scores to determine the Grand Total.

6 - body   3 - feeler

5 - head   2 - leg

4 - eye   1 - tail

1.	2.	3.	SCORE 1. ____ 2. ____ 3. ____
4.	5	6.	4. ____ 5 ____ 6. ____
7	8.	9.	7. ____ 8 ____ 9 ____ Total ____

A local bookstore is selling copies of Deal Me In *by Margie Golick. This book describes card games that help develop arithmetic skills for children five years to adult. The following games are found in the book.*

Tough Beans

A full deck of 52 cards is used. Each card is counted for its face value: Jacks = 11; Queens = 12; Kings = 13. The object of the game is to be the first to get rid of your cards.

Eight cards are dealt to each player. Then the pack is placed in the middle as a stock and the top card is turned face-up.

The player to the dealer's left plays face-up any card overlapping the turned-up card so that the denominations of both are visible. Next player must put down any number of cards whose total denominational value is equal to the sum or the difference of the two face-up cards. For example, if the face-up cards are King and 9, the next player must play cards totalling 22 (sum) or 4 (difference). After showing players his cards, he stacks them so that only one card is visible, and lays them on the face-up cards, again overlapping so there are again two cards (the last one played by the previous player, and the top card played by the player who has just completed his play) whose sum or difference must be arrived at by the next player.

When a player cannot arrive at the necessary total from the cards in his hand, he must draw from the stock until he is able to do so.

Up and Down

Numerical sequence regardless of suit and numerical sequence within suits are the important considerations in this game.

The deck is dealt out between the two players. Cards are left in a face-down pile before each player. The object of the game is to be the first to get rid of all your cards.

Players take turns facing up their cards - one at each turn - onto a pile in front of their face-down stacks. If a card is an Ace, it is put in the center of the table. Cards faced up may be played to the center (building upwards in suit sequence on the Aces) or on an opponent's face-up pile in sequence up or down regardless of suit. Thus, if one player has a Queen on the top of his face-up pile, the other player may place any Jack or King; if he has a 5 on top, any 4 or 6 may be played on it.

If a face-up card can be played, either to the center or on opponent's pile, player can have another turn and continue to face up cards until he can make no more plays. The top card of the face-up pile is always available for play.

When the face-down stack is exhausted, the face-up pile is turned over and play continues.

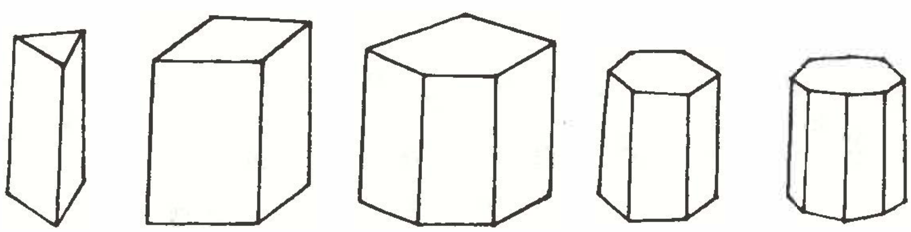
Change Anyone?

Everyone you ask says that he doesn't have the necessary coins for making change for a dollar bill. A few people, of course, just do not have enough coins. You look at the handful of coins held out by a friend and see that although they total more than $1.00, no combination of those coins will equal one dollar exactly. What is the largest amount of money you can have in coins, and still not be able to change $1.00?

Answer: four 1¢; four 10¢; three 25¢

Prisms

Use these models of prisms to help complete a chart like the one below. A prism is named by the shape of its base.



Prisms	Number of Faces	Number of Vertices	Number of Edges
Triangular			
Square-based			
Pentagonal			
Hexagonal			
Heptagonal			
Octagonal			
Decagonal			

1. Can you see a pattern? If so, what is it?
2. Without looking at models, complete the chart for: heptagonal, decagonal prisms.

Patterns

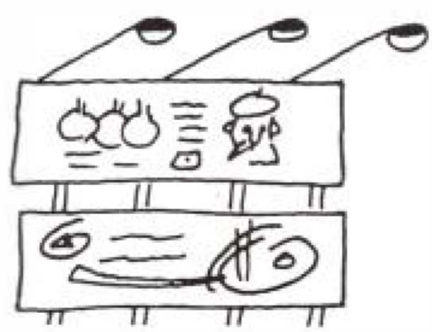
1. Have students use 0.5 cm graph paper and continue numbering around the spiral.
2. Ask students to discover patterns.
   a. Is there a ray which contains only the squares?
   b. Is there a ray which contains only the squares of odd numbers?
   c. Does one ray contain only primes?
   d. Can the corner numbers be found without counting each square?
   e. 16 + 4 = 5 + 15
   Does this pattern always hold? Ever hold?

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

16	15
5	4

Daffynition

A double-decker billboard?



Answer: Cosine

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Mathematics Contest

A student mathematics contest held annually at Villanova University had two problems on the 1975 paper which were missed by most participants. Try them and Good Luck!

1. A motorist mounted snow tires on his car that were one inch more in diameter than the regular tires. The diameter of the regular tires was 20 inches. How many fewer revolutions per mile does each wheel make?

2. The sides of a trapezoid have measures of 20, 21, 21, 50 going in one direction. The measures of the parallel sides are 21 and 50. Find the area of the trapezoid to the nearest tenth.

And They Aren't Easy!

The problems below were part of the application form for the Student Science Training Program held at the University of Chicago in the summer of 1975. And they aren't easy! Try them.

1. The integer 25 is a "perfect square" since it is a square of another integer, namely the integer 5. The least positive remainder of 25 upon division by 8 is 1. Find, if possible, an integer which is a perfect square and which has the least positive remainder 3 upon division by 8.

2. Let A,B,C,D and E be five towns such that the straight line distance between A and B is 30 miles, between B and C is 80 miles, between C and D is 236 miles, between D and E is 86 miles and between E and A is 40 miles. Can you find the distance between C and E without a map?

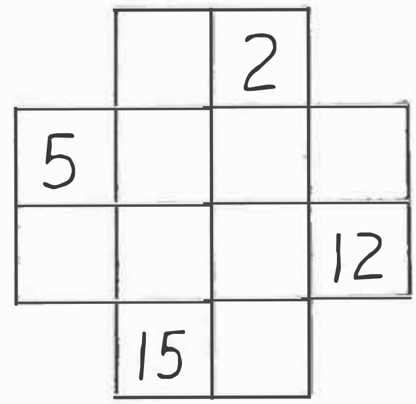
3. In a very hotly fought battle, at least 70 percent of the combatants lost an eye; at least 75 percent an ear; at least 80 percent an arm; at least 85 percent a leg. How many lost all four members?

4. Nine students use a fraternity dining room which has four tables with three settings on each table. How should one vary the seating arrangement so that in four days each student should share a table at dinner with each other student?

Four Rows, Same Totals

Fill in the squares following these directions:

1. Use any numbers you want, so long as each figure is less than 15.
2. A number can be used just one time, and cannot duplicate a number already shown here.
3. When finished, the two long horizontal rows and the two long vertical rows will add up to identical totals, creating a Magic Cross.



Answer:

	3	*2*	
5	*10*	*11*	*8*
9	*6*	*7*	*12*
	15	*14*	

A set of four booklets by Swartz and Gardner and published by Houghton Mifflin entitled Measurement Concepts and Applications *offers a variety of interesting metric activities. The following activities come from Book 3 in this series.*

Rates and Shapes

An object gives off heat through its surface. So maybe the surface area of the object will affect its rate of heat loss. You can check up on this. Get two light plastic containers. One container should have a large diameter. The other should have a much smaller diameter. Pour equal volumes of hot water into the containers.

Read the temperature in each container every two minutes for ten minutes and make a record of the results.

Measure the surface area of the water that is in contact with the air.

Narrow container: diameter ________ cm
surface area of water ________ cm^3

Wide container: diameter ________ cm
surface area of water ________ cm^3

Does the surface area of the water affect the rate of heat loss? How?

More Bounce to the Gram

Does the height that a ball bounces depend on how far it falls? Does it depend on the kind of ball that's bouncing?

Drop a ball from a height of one metre. Have a friend watch the ball and place a clothespin on the metre stick at the height to which the ball bounced. Repeat the experiment until the clothespin is at the right place. Record the bounce height.

Repeat the experiment using drop heights of 50 cm, 150 cm and 200 cm.

Make a graph of the results.

Who is Ahead?

Last year another company in town offered you an interesting new job. However, it required taking a 10 percent decrease in salary. To make the switch didn't make sense, so you declined the job.

Your friend George was restless to try new areas, so he took the job. He got a 10 percent lower salary, and you received a 10 percent salary increase for loyalty.

This year, George did so well he received a 10 percent increase. Your company was hit by hard times, so you had to take a 10 percent reduction in salary.

Financially, who is ahead? You both started into last year with $10,000 salary apiece.

Answer: Both make $9,900