Kindergarten

- 6.5.1 Sort objects and use one or more attributes to solve problems.
- 6.5.2 Re-sort objects using new attributes.
- 6.5.1 Sort objects into sets and describe how the objects were sorted.
- 6.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.
- 6.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.
- 6.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies.
- 6.3.1 Identify, duplicate, and extend simple number patterns and sequential and growing patterns.
- 6.3.1 Use a variety of manipulatives (such as connecting cubes, number cards, shapes) to create patterns.
- 6.3.2 Recognize attributes (such as color, shape, size) and patterns (such as repeated pairs, bilateral symmetry).
- 6.1.1 Use mathematical language, symbols, and definitions while developing mathematical reasoning.
- 6.1.2 Apply and adapt a variety of appropriate strategies to problem solving, including estimation, and reasonableness of the solution.

1st Grade

- 6.5.1 Use various representations to display and compare data.
- 6.5.4 Count and compare collected data.
- 6.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.
- 6.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.
- 6.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies.
- 6.1.1 Use mathematical language, symbols, and definitions while developing mathematical reasoning.
- 6.5.1 Represent measurements and discrete data using concrete objects, picture graphs, and bar graphs.

2nd Grade

- 6.5.2 Determine whether an event is likely or unlikely.
- 6.5.1 Use and understand various representations to depict and analyze data measurements.
- 6.5.3 Explain whether a real world event is likely or unlikely.
- 6.5.4 Predict outcomes of events based on data gathered and displayed.
- 6.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.
- 6.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.
- 6.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies.
- 6.1.5 Use mathematical ideas and processes in different settings to formulate patterns, analyze graphs, set up and solve problems and interpret solutions.
- 6.1.6 Read and interpret the language of mathematics and use written/oral communication to express mathematical ideas precisely.
- 6.1.1 Use mathematical language, symbols, and definitions while developing mathematical reasoning.
- 6.1.2 Apply and adapt a variety of appropriate strategies to problem solving, including estimation, and reasonableness of the solution.

3rd Grade

- 6.5.1 Organize, display, and analyze data using various representations to solve problems.
- 6.5.3 Compare and interpret different representations of the same data.
- 6.5.4 Solve problems using data from frequency tables, bar graphs, pictographs, or line plots.
- 6.5.3 Make predictions based on various representations of data.
- 6.5.2 Solve problems in which data is represented in tables or graph.
- 6.5.1 Interpret a frequency table, bar graph, pictograph, or line plot.
- 6.3.3 Describe and analyze patterns and relationships in contexts.
- 6.1.4 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, and observing patterns.
- 6.1.8 Explain and justify answers on the basis of mathematical properties, structures, and relationships.
- 6.1.12 Analyze and evaluate the mathematical thinking and strategies of others.
- 6.1.13 Create and use representations to organize, record, and communicate mathematical ideas.

4th Grade

- 6.5.1 Collect, record, arrange, present, and interpret data using tables and various representations.
- 6.5.2 Use probability to describe chance events.
- 6.5.6 Determine a simple probability.
- 6.5.7 Express a probability pictorially.
- 6.5.1 Depict data using various representations (e.g., tables, pictographs, line graphs, bar graphs).
- 6.5.2 Solve problems using estimation and comparison within a single set of data.
- 6.5.4 List all possible outcomes of a given situation or event.
- 6.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies.
- 6.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.
- 6.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.

5th Grade

- 6.5.1 Make, record, display and interpret data and graphs that include whole numbers, decimals, and fractions.
- 6.5.2 Describe the shape and important features of a set of data using the measures of central tendency.
- 6.5.1 Depict data using various representations, including decimal and/or fractional data.
- 6.5.2 Make predictions based on various data representations, including double bar and line graphs
- 6.5.3 Calculate measures of central tendency to analyze data.
- 6.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.
- 6.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.
- 6.1.5 Use mathematical ideas and processes in different settings to formulate patterns, analyze graphs, set up and solve problems and interpret solutions.
- 6.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies.

6th Grade

- 6.5.1 Understand the meaning of probability and how it is expressed.

- 6.5.1 Understand that the probability of an event is a number between zero and one that expresses the likelihood of its occurrence.
- 6.5.2 Identify the probability of an event as the ratio of the number of its actual occurrences to the total number of its possible occurrences.
- 6.5.3 Express probabilities in different ways.
- 6.5.4 Understand the difference between probability and odds.
- 6.5.5 Analyze a situation that involves probability of an independent event.
- 6.5.6 Estimate the probability of simple and compound events through experimentation or simulation.
- 6.5.7 Apply procedures to calculate the probability of complimentary events.
- 6.5.1 Determine the theoretical probability of simple and compound events in familiar contexts.
- 6.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.
- 6.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.
- 6.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies.
- 6.1.5 Use mathematical ideas and processes in different settings to formulate patterns, analyze graphs, set up and solve problems and interpret solutions.
- 6.1.1 Use mathematical language, symbols, and definitions while developing mathematical reasoning.

7th Grade

- 6.5.2 Select, create, and use appropriate graphical representations of data.
- 6.5.5 Understand and apply basic concepts of probability.
- 6.5.2 Interpret and solve problems using information presented in various visual forms.
- 6.5.4 Use proportional reasoning to make predictions about results of experiments and simulations.
- 6.5.6 Use a tree diagram or organized list to determine all possible outcomes of a simple probability experiment.
- 6.5.1 Interpret and employ various graphs and charts to represent data.
- 6.5.4 Use theoretical probability to make predictions.
- 6.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.
- 6.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.

- 6.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies.
- 6.1.5 Use mathematical ideas and processes in different settings to formulate patterns, analyze graphs, set up and solve problems and interpret solutions.
- 6.1.2 Apply and adapt a variety of appropriate strategies to problem solving, including estimation, and reasonableness of the solution.

8th Grade:

- 6.5.2 Compare probabilities of two or more events and recognize when certain events are equally likely.
- 6.5.1 Solve simple problems involving probability and relative frequency.
- 6.5.1 Calculate probabilities of events for simple experiments with equally probable outcomes.
- 6.5.2 Use a variety of methods to compute probabilities for compound events (e.g., multiplication, organized lists, tree diagrams, area models).
- 6.3.13 Represent situations and solve real-world problems using symbolic algebra.
- 6.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.
- 6.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.
- 6.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies.
- 6.1.5 Use mathematical ideas and processes in different settings to formulate patterns, analyze graphs, set up and solve problems and interpret solutions.

High School: Algebra

- 2.5.2 Use statistical thinking to draw conclusions and make predictions.
- 2.5.3 Understand basic counting procedures and concepts of probability.
- 2.5.1 Identify patterns or trends in data.
- 2.5.12 Use techniques (Venn Diagrams, tree diagrams, or counting procedures) to identify the possible outcomes of an experiment or sample space and compute the probability of an event.
- 2.5.17 Perform simulations to estimate probabilities.
- 2.5.18 Make informed decisions about practical situations using probability concepts.

High School: Algebra 2

- 3.1.6 Employ reading and writing to recognize the major themes of mathematical processes, the historical development of mathematics, and the connections between mathematics and the real world.
- 3.3.12 Interpret graphs that depict real-world phenomena.
- 3.5.3 Use data and statistical thinking to draw inferences, make predictions, justify conclusions and identify and explain misleading uses of data.
- 3.5.4 Develop an understanding of probability concepts in order to make informed decisions.
- 3.5.10 Design simple experiments to collect data to answer questions of interest.
- 3.5.13 Apply both theoretical and experimental probability to analyze the likelihood of an event.

- A Wizard of Odds!

Someone may have told you that chance is just a roll of the dice but...actually chance IS just a roll of the dice!

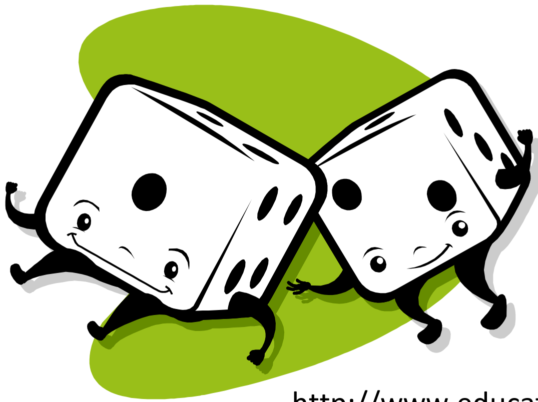
When you’re becoming a Probability Wizard, a Wizard of Odds, chances are you’re going to be using dice a lot. Ever wonder where in the world dice came from? Well, no one really knows. Dice have been found in 4,000 year old Egyptian tombs, and it’s believed they were created and used by many different peoples and cultures around the world. In Ancient Greece people believed that the outcomes of dice throws were controlled by the gods. That’s why they used dice throws to divide inheritances, decide who got what, choose rulers, and predict the future.

Ancient dice were often made out of animal knucklebones, which is why people sometimes call rolling dice, rolling the bones.

People liked dice games in Ancient Greece, Rome, and in Europe. There’s even a legend that King Henry the 8th lost the bells of St. Paul’s Cathedral in a dice game. Dice weren’t really used in games until the 1700s and they were still made of bone and wood until the 1900s, when they started being made out of plastic.

Basic Probability

What are the chances you are a math wizard? Find out while we review the ins and outs of probability! You’ll learn all about what probability means, why we study it, and how to express a probability on paper. Using dice as an example, Tim will show you how to determine the number of possible outcomes in a random event. You’ll also learn how to use a grid to figure out. Probabilities aren’t just for predicting dice rolls - the principles you’ll learn are the basis for predictions in all kinds of complex systems, from the stock market to the weather!



Hunting for Snake Eyes!

http://www.education.com/activity/article/Snake_Eyes_the_SAT/ (9/15/10) Article by Cindy Donaldson

Dice are a great way to teach students about probability. The different combinations they offer are the perfect grounds for many standardized test questions. For instance, your teen might need to answer a question such as, “What’s the probability that the total of two rolled dice will be 9?”

$$\text{Probability} = \frac{\text{The number of ways a result can happen}}{\text{The number of possible results}}$$

Here’s a quick activity that will help your student figure out and remember the difference between rolling Snake Eyes and Lucky Number Seven!

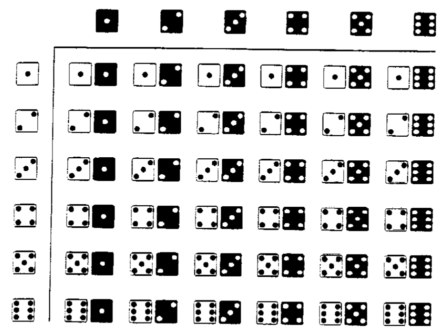
Materials:

- A pair of dice, two different colors (I’ll use red and blue for examples)
- A piece of paper
- Some M&M’s or another little treat

What You Do:

1. Tell your students that you’re going to learn all about dice and probability.
2. Ask them how many different ways there are to roll 2 dice. Remind them that there are 6 options on both sides. Together, you can determine that there are 6 x 6 = 36 possible rolls.
3. Ask them how many ways there are to roll a total of “2” using two dice. After thinking, they should conclude that there’s only one way: 1 + 1

4. Ask him how many ways there are to roll a total of "7." He should come up with 6 ways: 1 + 6, 6 + 1, 2 + 5, 5 + 2, 3 + 4, 4 + 3.
5. Time to figure out all of the rolls. Have him fill out the last two columns of the following chart. He has already figured out "2" and "7," and he can do the rest the same way. *Have students fill out and use the included dice chart (like the one to the right) to help them visually see the possibilities.*



Total to Roll	Ways to Get the Total	Probability of that Roll
2	1	1 /36
3		/ 36
4		/ 36
5		/ 36
6		/ 36
7	6	6 /36 = 1/6
8		/ 36
9		/ 36
10		/ 36
11		/ 36
12		/ 36

When they are done, the chart should look like this:

Total to Roll	Ways to Get the Total	Probability of that Roll
2	1	1 / 36
3	2	2 / 36 = 1/18
4	3	3 / 36 = 1/12
5	4	4 / 36 = 1/9
6	5	5 / 36
7	6	6 / 36 = 1/6
8	5	5 / 36
9	4	4 / 36 = 1/9
10	3	3 / 36 = 1/12
11	2	2 / 36 = 1/18
12	1	1 / 36

6. Here's a dice challenge for them. First, tell them the roll you want him to try and get. Then, give them two opportunities to win a reward (like a small piece of candy.)

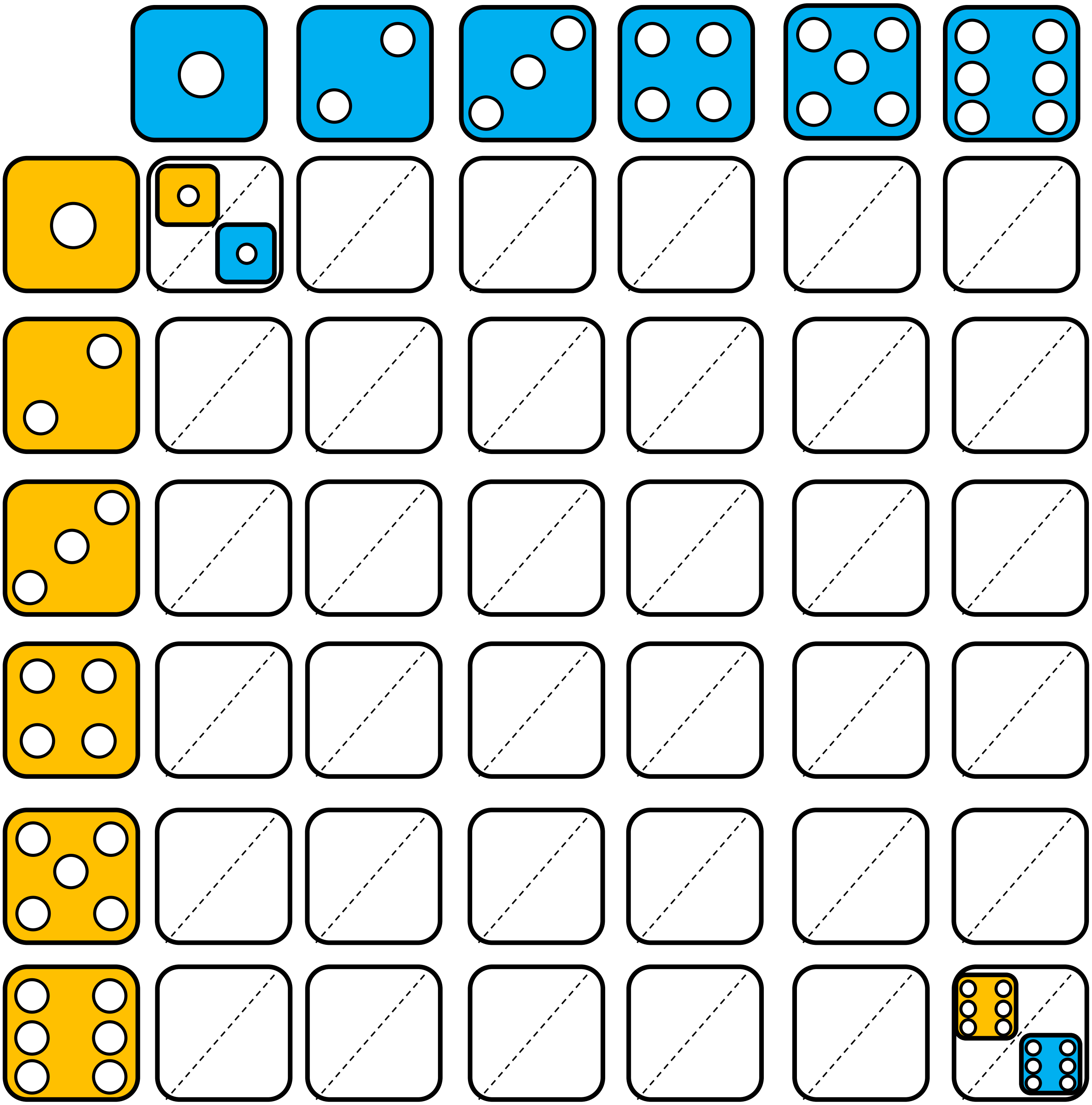
They can win an award if they rolls what you asked him to get. And, they can win another award for guessing the correct probability of rolling what you've asked of them. Good luck!

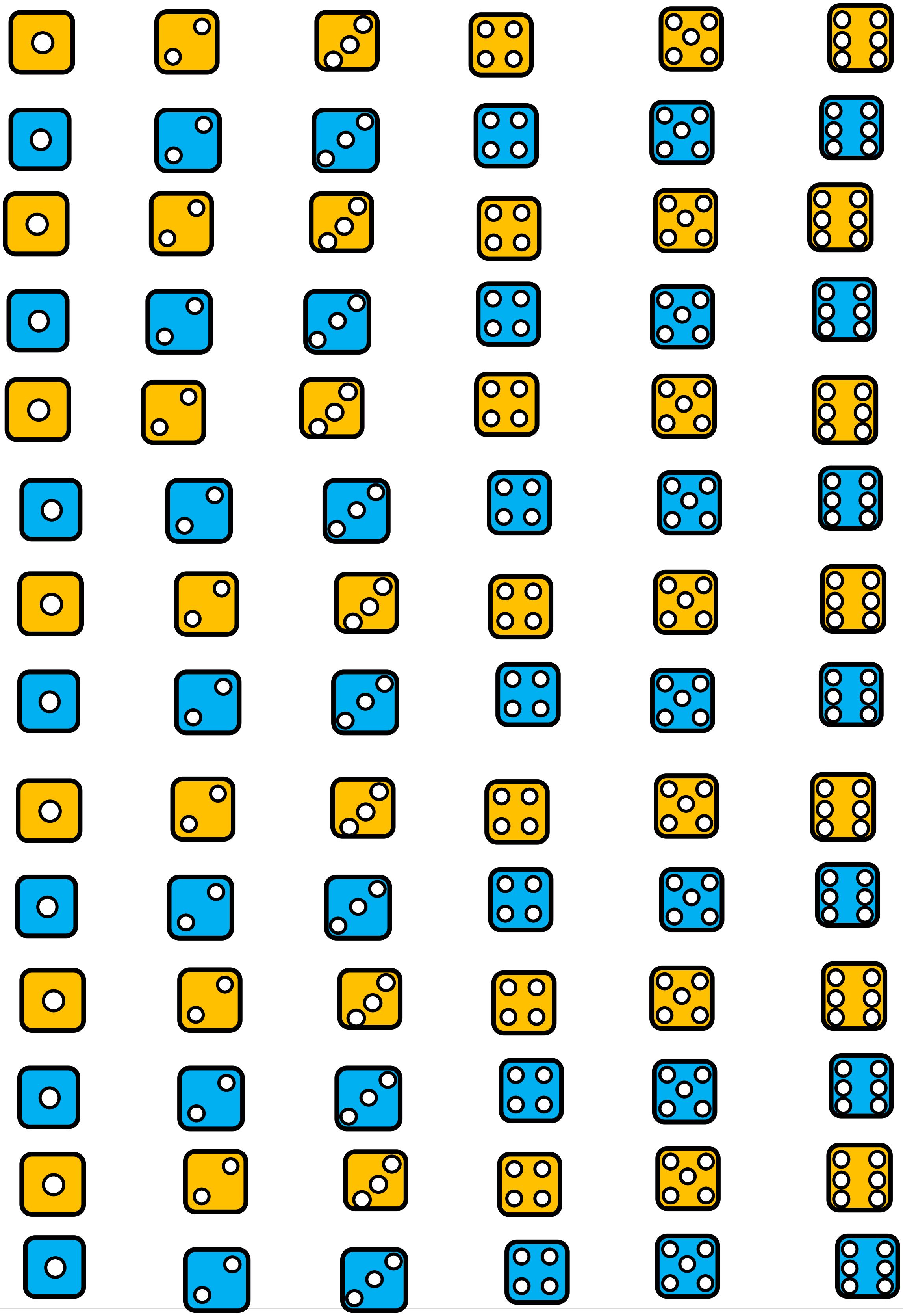
- Roll a total of "9" (1/9)
- Roll a total of "11" (1/18)
- Roll a total of 8" (5/36)
- Roll a total of "12" (1/36)
- Roll a total of "5" (1/9)
- Roll a "7" *or* an "11" (6/36 + 2/36 = 8/36 = 2/9)
- Roll a "2" *or* "6" (1/36 + 5/36 = 6/36 = 1/6)
- Roll a "2" *or* a "6" *or* a "7" *or* an "11" (1/36 + 5/36 + 6/36 + 2/36 = 14/36 = 7/18)
- You can make up your own as you go

Extension:

Tell your students, if they don't already know, that the game "Craps" is all about rolling two dice over and over. Ask them if he could figure out why "7," "2," and "12" are the most important rolls. If you know more about the game, it's a great way to teach probability.

Name: ______________________________________





Deal or No Deal?

That is the Question!

The game show Deal or No Deal is a great way to practice probability. At its heart, the show is about figuring out your chances of getting a better deal by playing on or taking the bank's offer--in other words, your probability of getting the better deal.

Introduce probability before playing the game. Start with a question such as: "Every time I flip a coin, I have a 50/50 chance of landing on heads or tails. So if I flip it 50 times, I should get 25 heads and 25 tails, right?" This kicks off a discussion about theoretical probability, which you will then test. Have small groups flip a coin 50 times and tally heads and tails. Then come back together and compared their data (experimental probability) to your theoretical probability.

Materials:

- Briefcase cards numbered 1-26
- Bank offer cards to provide a random offer each round
- Cash cards to hide under the Briefcase cards
- Deal/No Deal flip card to accept or not accept the deal
- Graphic organizer where students will calculate the probability of getting a better deal by saying "no deal" after each bank offer.

The game play is simple:

1. Take one briefcase to hold onto which could be yours at the end of the game.
2. Each round, players open a diminishing number of briefcases, starting with six in Round One and ending with one in Round Nine. (Round 1 = 6 cases, 2 = 5 cases, 3 = 4 cases, 4 = 3 cases, 5 = 2 cases, 6 = 1 case, and every other round would also be one case to open.)
3. After the briefcases are opened, the bank makes an offer, and the player can accept it (deal) and the game is over, or reject it (no deal) and keep playing.
4. If the player rejects all bank offers, they will be left with their briefcase and one other, and choose which they will open. Whatever they choose is the amount they win.
5. Students will write in the results of each round, like so:

Round	Bank Offer	# of briefcases left with more money than Bank Offer	Probability of winning more than Bank Offer	Deal or No Deal?
1	$100,000	5	5/20 = .25 = 25%	No Deal

After each offer from the bank, calculate your chances of getting a better deal by continuing to play. In the above example, 6 out of 26 total briefcases are opened in the first round, leaving 20 unopened. If there were only 5 unopened cases containing more than $100,000, the chances of getting a better deal was 5 out of 20, which can be written as 5/20, .25, or 25%.

If there is only a 25% chance that the player will win more than the $100,000 offer shouldn't we say Deal?

That makes sense mathematically, but not in the context of playing the game. First, if it's only the first round of the game, you can't expect anyone to say "deal" no matter the odds. Secondly, players usually make their decisions based on their chances of getting the million dollar briefcase. The way this game works, your probability of getting a better deal by playing can actually increase as the game goes on, because the offers are random (and thus may decrease).

Don't the offers play into our decisions?

The offers absolutely play into decisions, because in the card game, the offer is randomly drawn from a deck or written by the Host. So the offers don't always make sense (as they would during the real game), which helps extend the game time as students rarely get a good deal.

If students got an offer of $10 with $1, $5 and $1,000,000 on the board, they would only have a 33 1/3% chance of getting a better deal. Mathematically speaking, it's not a great deal, but just like the earlier discussion about not taking the best *mathematical* deal, not taking the chance that late in the game just isn't any fun in the context of the game.

Also, keep in mind that the students are not bound by probability, it's meant to be an advisory. If they want to take the deal at any point, even with a small chance of getting the big money, they can and most likely will. The idea is to show them exactly how slim those chances are, and that games like these are rarely skewed in their favor.

In the end, the math shouldn't trump the fun of the game, of taking a chance at some point.

Playing the Game

You can magnets to hold the briefcase cards and cash cards underneath on the board (you could also use a hanging pocket display with clear pockets, the kind you often see in elementary classrooms). The teacher can play Host Howie, there won't be any models to open the cases, and the class will play as a whole group.

After picking a student to start you off by claiming "our" case, have students pick each other "popcorn style" to choose the briefcases to open each round, or to eliminate confusion establish and order and use it each round. When it comes time for the bank offer, the Host can pretend to get calls and text messages from the bank on a cell phone. Students and Host will then figure out the probability, fill in the graphic organizer like the example above, and decide whether to take the deal.

If students start to argue over taking the deal or not (especially once the million dollars comes off the board, have students vote.

Students only need their graphic organizers and a calculator to help convert fractions to decimals and percents (since probability is shown in all three ways).

At lower levels, students should be learning (or have learned) converting between fractions, decimals and percents, regardless of the probability aspect. You may want to give them some problems before then to gauge their ability, and if they don't seem ready, you can downplay the conversion part of it. You might just ask them to consider if each fraction is more or less than half, which is an easier way to conceptualize it and to help them decide to take the deal or not.

Extensions:

Have students create their own probability game, or adapt an existing game to include probability calculations. This would encourage higher order thinking and make it more memorable for the long term, as well as provide a game they could later play for review.

The Next Level of Wizardry: Mathematical Expectation

Teach students who are ready for the next level of Wizardry how to win using mathematical expectation. *(A weighted average: The sum of the values of all separate outcomes times the probabilities of those outcomes. The expected average outcome per trial for an extended number of trials.)*

Let's face it: it's pure agony watching someone turn down hundreds of thousands of dollars in hopes that they'll make more, only to watch them get burned in the end and settle for far less than the amount that they already turned down. Despite that, playing the risk/reward game with such large sums of money is enough to catch anybody's attention, and people in general are attracted to games of this nature (Vegas, anyone?).

What would you do?

Here is the contestant's scenario: She has 5 suitcases left that contain the following amounts: \$100, \$400, \$1000, \$50,000, and \$300,000; and the banker offers you \$80,000 to quit. Deal or No Deal?

(Ask the students what they would do.) Let us say she uttered the words the audience was just *dying* to hear: **no deal**. In a beautifully ironic fashion, the very next suitcase she opens contains $300,000. And of course, the audience offers her their oh-so-sympathetic "Ohhhhhhhhhhhhhhhhh."

While watching you had this intrinsic feeling that the woman just made a hideous decision, but is there a mathematical reasoning to back your feelings? Maybe it was simply one of those gut instinct things that you just kind of know…ya know? Let us look into the math a little more just to see if you were correct in your opinion.

If you consider only the suitcases in the scenario outlined above, then there is an 80% chance you'll walk away with at least $30,000 **less** than the offer that's currently on the table. Then again, you always have the banker in there as the x-factor, so that argument represents a worst case scenario. But this is kind of vague, so now we need to look for a more defined strategy…

Enter probability theory, and more specifically, the value that you can expect to earn based on the number of remaining suitcases and their associated dollar amounts. Not surprisingly, this is astutely named – wait for it – the expected value.

At the beginning of Deal or No Deal, you are presented with 26 suitcases that contain the amounts shown in the previous image, and the expected value can be calculated from the following equation:

$$E(X) = \left(.01 \cdot \frac{1}{26}\right) + \left(1 \cdot \frac{1}{26}\right) + \left(5 \cdot \frac{1}{26}\right) + \ldots$$

If no cases have been opened, then this value computes to approximately $131,477.54.

You mathematical wizards may already have noticed that the expected value for Deal or No Deal is simply the arithmetic mean, or more simply, **the average dollar amount remaining in the cases**. Risk aside, accepting a "deal" for less than the mean ($131, 477.54) should generally be regarded as a gutless, weak decision, and the contestant should be ridiculed accordingly. However, late in the game, if a savvy contestant were to wrangle an amount out of the banker that is greater than the mean of the remaining cases, then he or she ought to be carted off stage like a champion bull fighter.

Okay, so maybe that's a bit of an exaggeration, but look at things in a purely mathematical light here. If you don't consider "luck" to be of any help to you (and you shouldn't – although I see you over there with that scratch-off lottery ticket!), then when you begin the game, your goal ought to be to "beat the mean." Obviously, the mean changes as suitcases are removed, but regardless of the mean at any given time, your goal should remain the same: **beat the mean**.

Let's say that you got unlucky and blew off the 13 most valuable cases on your first 13 suitcase removals. It should be abundantly clear at this point that you're not going to walk out with a wad of cash, but you should still be expecting no less than $185.85, which is the mean. If you made it to this particular point in the game and the banker were to offer you $200, then in you had better take it. If you prefer mathematical facts, then try this on: **it would be a statistical mistake not to accept this offer**.

So, with this in mind, let's revisit our contestant from the scenario above. Remember her? She's got 5 cases left that contain the following amounts: $100, $400, $1000, $50,000, and $300,000. The banker has offered her a cool $80,000. A quick calculation reveals that the mean of the remaining amounts is $70,300. The banker's offer is $80,000, which represents roughly a 13.8% increase above the mean. This isn't Wall Street, but SELL SELL SELL!

Look a little closer at the reality of the situation. 80% of the remaining briefcases have *at least* $30,000 less than the banker's proposed amount in them. The only **guaranteed** way she can do better than the proposed amount is to actually be holding the $300,000 case, because if she were to remove more cases and reveal amounts less than $300,000, the banker's offer would likely go up to compensate for the increasing mean. Keep in mind, however, that there's only a 20% probability of this happening! Oh, also keep in mind that the $80,000 offer is guaranteed. That's cash money, and all bets are off! 100% chance of success…going once…going twice…Ah, forget it.

After a closer look at the numbers behind the game, it's clear that our contestant made a decision that was not supported by statistical analysis. Instead of the best case scenario, which she was betting on, she actually got the worst case scenario because the next case she opened contained the $300,000. Ouch.

Let's say after that fiasco, the banker came back with a generous offer of $21,000, which would be how much 63.1% greater than the new mean of . . .? [$12,875]. *Deal or No Deal?* How much of a **loss** against the starting mean of the game would she have?

NAME:

PERIOD:

DEAL OR NO DEAL

$ .01	$ 1,000
$ 1	$ 5,000
$ 5	$ 10,000
$ 10	$ 25,000
$ 25	$ 50,000
$ 50	$ 75,000
$ 75	$ 100,000
$ 100	$ 200,000
$ 200	$ 300,000
$ 300	$ 400,000
$ 400	$ 500,000
$ 500	$ 750,000
$ 750	$ 1,000,000

CASH WON ____________

Round	Bank Offer	# of briefcases left with more money than Bank Offer	Probability of winning more than Bank Offer	Deal or No Deal?
1				
2				
3				
4				
5				
6				
7				
8				
9				


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


DEAL!


NO DEAL!

$0.1

$5

$10

$25

$50

$75

$100

$200

$300

$400

$500

$750

$1,000

$5,000

$10,000

$25,000

$50,000

$75,000

$100,000

$200,000

$300,000

$400,000

$500,000

$750,000

$1,000,000

$1

Bank Offer!

$20

Bank Offer!

$1,000

Bank Offer!

$10

Bank Offer!

$11,750

Bank Offer!

$200,000

Bank Offer!

$500

Bank Offer!

$2,500

Bank Offer!

$.50

Bank Offer!

$90,000

Bank Offer!

$45,000

Bank Offer!

$12,000

Bank Offer!

$500,000

Bank Offer!

$25,00

Bank Offer!

$32,975

Bank Offer!

$45

Bank Offer!

$85,630

Bank Offer!

$

Bank Offer!

$

Bank Offer!

$

Bank Offer!

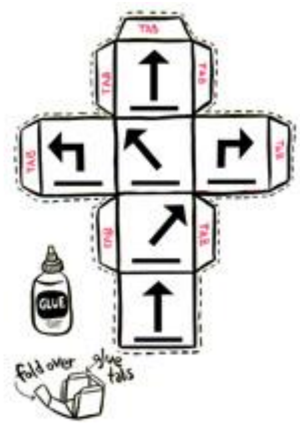
$

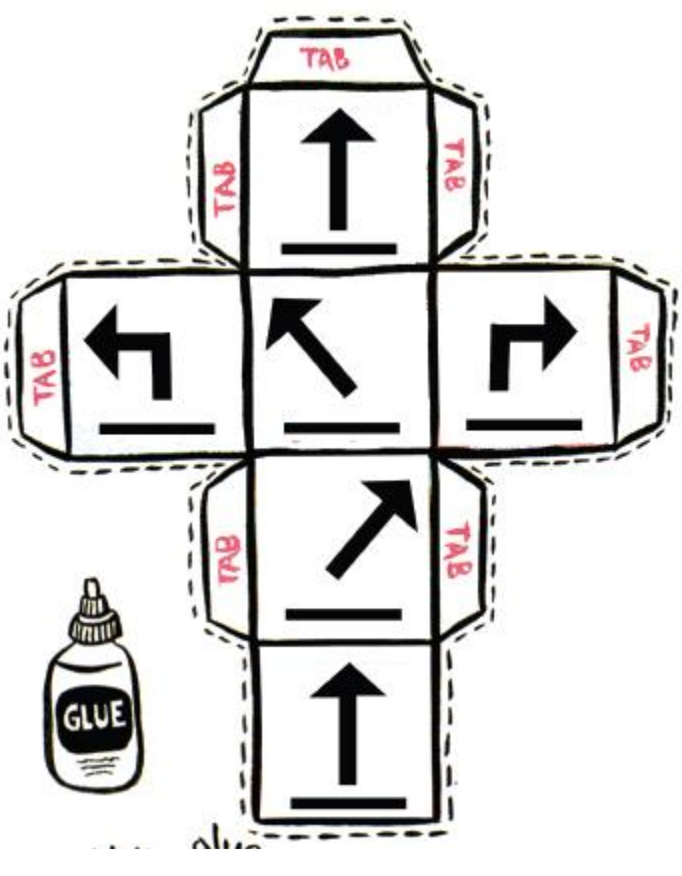
Bank Offer!

$

Bank Offer!

$


fold over glue tabs


TAB
TAB
TAB
TAB
TAB
TAB
TAB
GLUE