

7th Grade Math

Books and Supplies: Saxon Math 8/7 with Pre-algebra, Third Edition, Student Edition

A Note about Standards: While I normally include standards covered with each lesson, I simply don't have the space to do so in math. I have constructed math lessons with two things in mind. First, to cover every standard. If you finish the math program you will have covered all of Utah 7nd Grade Core Standards for math. I have added supplemental lessons (below) to ensure those standards that Saxon doesn't include are covered. Secondly, I've taken into account the layout of the Saxon program. The book does not teach the lessons in units. It does, however, build upon each lesson using what was learned in previous lessons. Rather than organizing units, I've decided to follow the Saxon program to ensure that the review portion of the lessons is covered before expecting your child to do it in the workbook. The lessons that are skipped in the Saxon book are ones that do not specifically meet standards for Utah 7th Grade. This does not mean that you have to skip them. You may want to use them as a part of a "review day" lesson.

Saxon Math Program: Each Saxon lesson includes instruction, examples with solutions, practice, and problem sets. Review the instruction and example with your child as needed for each lesson. Then, ask your child to work through the problem set on their own, correcting it and providing additional instruction as needed.

Review Days: Every so often your child will have a Math Review Day. Take time on this day to review a lesson or concept that your child hasn't fully grasped. Cover a lesson again, find a math game that can teach it, work on flash cards and math fact mastery, or let your child choose one of their favorite worksheets to do again. If your child has mastered everything, do one of the skipped lessons, read and prepare a fun recipe, play a card or board game (most of them have a math element), or take the day off from math.

Math Games: These days are meant to be a fun review of previous or current lessons. This could be flash cards, card/board games, or games online. Prodigy is a great review for math concepts. It's a fun game that really has helped my visual learner to make connections because it motivates him to get the right answer. You can sign up with a free account [here](https://sso.prodigygame.com/game/start?rid=e5186a1d-5420-4a2a-9a36-4a29ec60352f) (https://sso.prodigygame.com/game/start?rid=e5186a1d-5420-4a2a-9a36-4a29ec60352f). Other websites with appropriate games can be found [here](#), [here](#), and [here](#).

Supplemental Lessons:

Lesson 1: Halloween

Print the Halloween worksheet (2 pages) [here](#) and ask your child to measure the appropriate angles using a protractor. Correct as needed.

Lesson 2: Christmas

Choose and purchase a worksheet like those found on this [website](#). Ask your child to finish a worksheet or two and correct it as needed.

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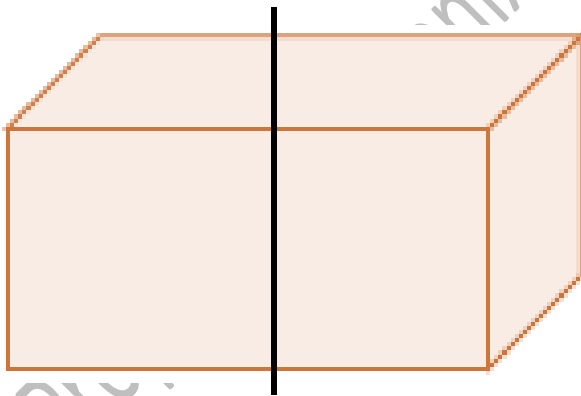
Lesson 3: Slicing Three-Dimensional Figures

Using a 3D shape model set like the one found [here](#) or the image found [here](#), review basic three-dimensional shapes with your child. Point out that 3D shapes have a height, width, and depth. We can measure and calculate these aspects and determine the surface area and volume of each shape. Briefly review the concepts behind finding this information (surface area is the sum of the area of each face, volume is $w \times h \times d$ and shows how much space fills the inside of the shape).

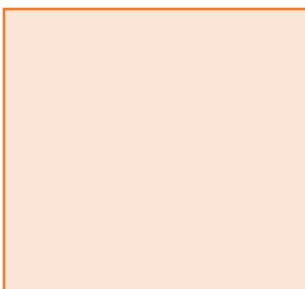
Next, point out that 3D shapes can be sliced into two-dimensional shapes. Use a loaf of bread as an example. Ask your child what shape a loaf of bread is: a rectangular prism.



Point out that we don't often eat the whole loaf of bread, we slice it into pieces, like in the following image.

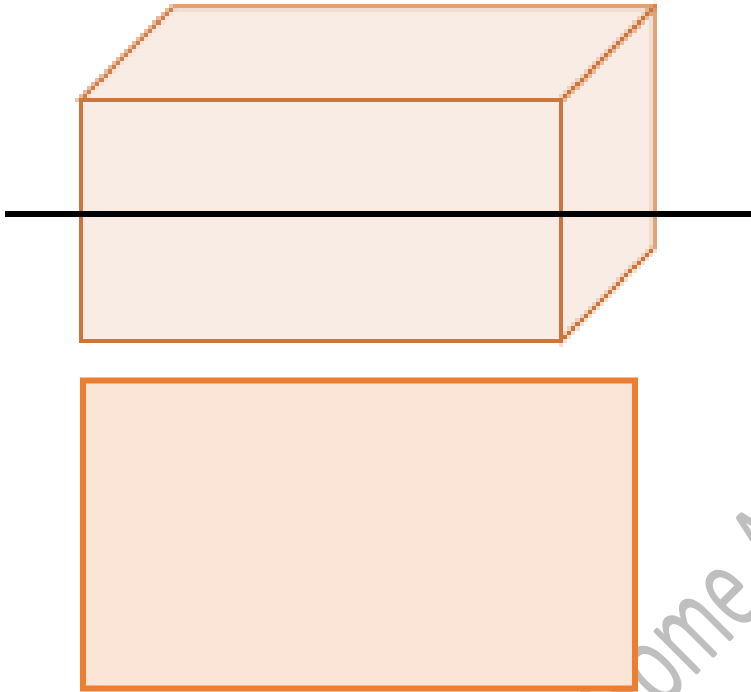


Ask your child what shape the 2D piece (slice) of the loaf of bread would be if cut on the line and perfectly flat, with no depth: a square



Explain that this is a 2D slice of a 3D figure, or a plane section. In this case, it is a plane section of a rectangular prism.

Explain that a vertical slice, made in the center of the shape, creates a square. However, a horizontal slice would create a different shape: a rectangle.



Next, ask your child to complete the worksheet for this lesson and correct as needed.

Lesson 3 Worksheet (2 pages)



What is the two-dimensional shape created if this shape is sliced vertically?

Horizontally?



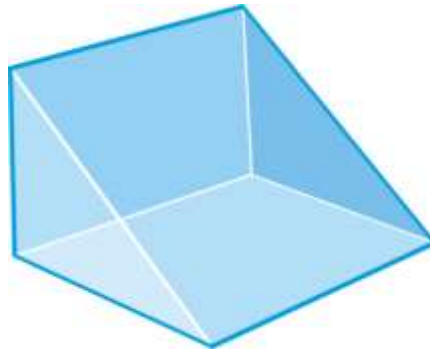
What is the two-dimensional shape created if this shape is sliced vertically?

Horizontally?



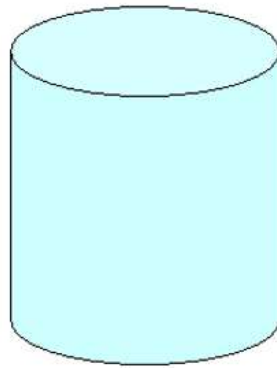
What is the two-dimensional shape created if this shape is sliced vertically?

Horizontally?



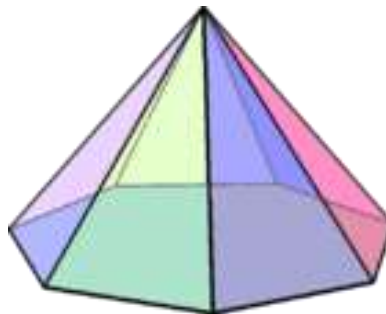
What is the two-dimensional shape created if this shape is sliced vertically?

Horizontally?



What is the two-dimensional shape created if this shape is sliced vertically?

Horizontally?



What is the two-dimensional shape created if this shape is sliced vertically?

Horizontally?

Lesson 4: Valentine's Day

Print the Valentine's worksheet [here](#) and ask your child to solve for and color each heart

Lesson 5: St. Patrick's Day

Print the St. Patrick's Day worksheet [here](#) and ask your child to find the mean, median, and mode of the data set presented.

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Lesson 6: Chance Probability

*For this lesson you will need a two-sided coin (penny, dime, nickel, quarter, etc.), graph paper, and the worksheet below.

Review the definition of probability with your child, explaining that probability is simply the likelihood that something will happen. Show your child the coin and ask them the probability of it landing on the heads side if the coin is flipped into the air. Explain that, since there are two sides and one of them is heads, the probability is $\frac{1}{2}$, or one of every two flips will likely be heads, or 50% of the flips. Point out that the probability is the same for the tails side: $\frac{1}{2}$ or 50%.

Next, give your child the worksheet below. Ask them to flip the coin 100 times, recording heads or tails after each flip.

After completing 100 flips, ask your child to record the total number of times the coin landed on heads and tails. Discuss how this number matches to the predicted 50/50 probability and point out that likelihood does not always match reality.

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Worksheet Lesson 6

Flip Number	Heads	Tails	Flip Number	Heads	Tails	Flip Number	Heads	Tails
1			41			81		
2			42			82		
3			43			83		
4			44			84		
5			45			85		
6			46			86		
7			47			87		
8			48			88		
9			49			89		
10			50			90		
11			51			91		
12			52			92		
13			53			93		
14			54			94		
15			55			95		
16			56			96		
17			57			97		
18			58			98		
19			59			99		
20			60			100		
21			61			Total Heads:		
22			62			Total Tails:		
23			63					
24			64					
25			65					
26			66					
27			67					
28			68					
29			69					
30			70					
31			71					
32			72					
33			73					
34			74					
35			75					
36			76					
37			77					
38			78					
39			79					
40			80					

Lesson 7: Classroom Probability

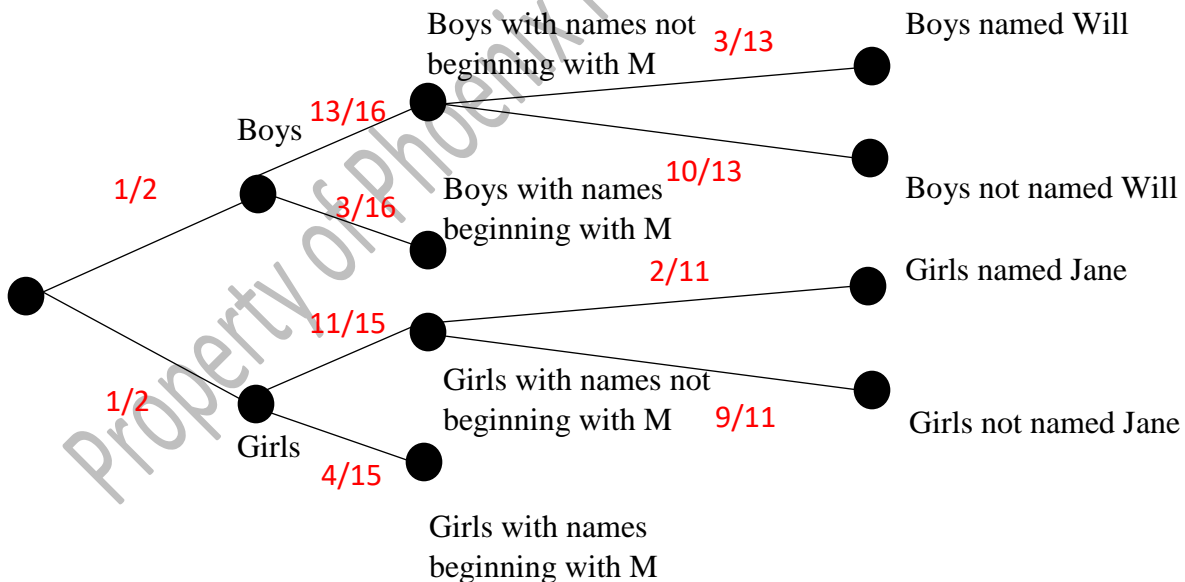
Review the previous lesson with your child, reminding them of the definition of probability and how it can help us guess the outcome in some situations. Point out that probability is not always reflective of reality, but is a good tool to find the most likely outcome.

Then, give your child the worksheet for this lesson, explaining that it shows a list of children in the class.

Ask your child to count the total number of children in the class, the total number of girls, and the total number of boys, filling in the appropriate areas on the worksheet. Then, ask your child to determine the probability of a girl being called on and of a boy being called on.

Next, ask your child to determine the probability of certain names being called, as outlined in the worksheet.

Finally, explain a frequency tree to your child, helping them to fill in the one at the bottom of the worksheet. Point out that the tree begins with the largest sampling (the entire class) and breaks it down into smaller groups with less probable outcomes. Use the key below to help your child add probability numbers to each line



Worksheet Lesson 7

Mrs. Brown's Class List

Girls		Boys	
Ruby	Taylor	David	Brayden
Lisa	Linda	Chris	Miles
Michelle	Elizabeth	Martin	Will W.
Christina	Jane C.	Jamal	José
Brittaney	Maria	Michael	Will M.
Krystal	Shanika	Lucas	Eli
Melissa	Mary	Will A.	Theo
Jane S.		Wesley	Noah

Total Number of Children: _____

Total Number of Girls: _____ Probability of a girl being called on: _____

Total Number of Boys: _____ Probability of a boy being called on: _____

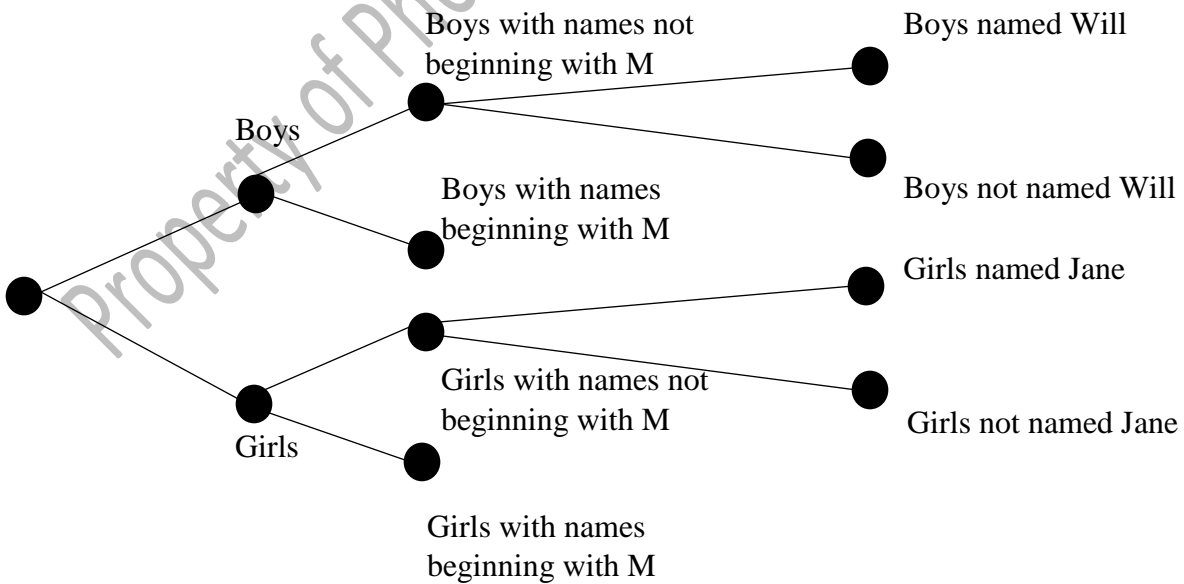
Probability of a Jane being called on: _____

Probability of a Noah being called on: _____

Probability of a girl's name beginning with M being called on: _____

Probability of a Will being called on: _____

Probability of any name beginning with M being called on: _____



Lesson 8: Simple vs. Compound Events

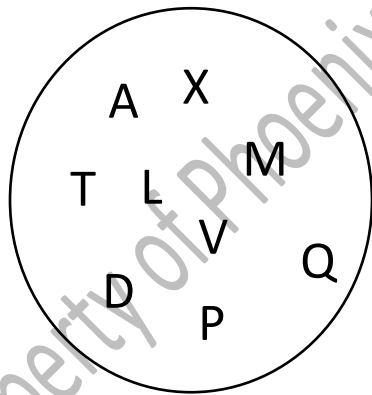
Remind your child that probability is the likelihood of a certain outcome given the population size and the number of chances for that specific outcome. Introduce the concept of simple vs. compound events. In simple events, we are searching for the chance of a single event occurring. For example, flipping a coin is a simple event and can only give us one of two outcomes. The probability of getting a result of heads or tails is $\frac{1}{2}$. If there is only one favorable result (the numerator is a 1), it is a simple event.

Compound probability is a combination of two or more simple events. For example, what is the likelihood of flipping a heads on a coin and rolling a number greater than 4 on a six-sided dice? To find a compound probability, you find the fractions for each event and multiply them together:

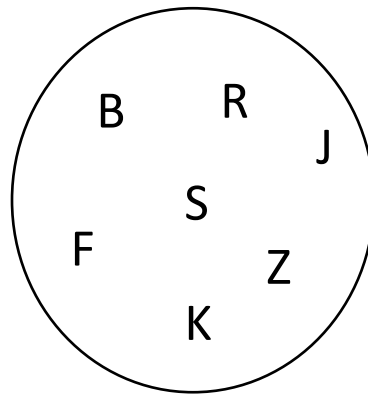
$$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

Work through the following examples with your child, then ask them to determine the probability of compound events on the worksheet below.

What is the probability that I will randomly choose an A from the first circle and a Z from the second?



$\frac{1}{9}$



$\frac{1}{7}$

$$\frac{1}{9} \times \frac{1}{7} = \frac{1}{63}$$

If 30% of students like reading, what is the probability I will have to question at least three students to find one who likes reading?

To solve this, I need to find the probability of students who like reading: 0.3, as well as the probability of those who do not: $1 - 0.3 = 0.7$. Next, we need to find the probability that all three students I ask do not like reading. To do this, we simply multiply: $0.7 * 0.7 * 0.7 = 0.343$. Finally,

in order to determine the probability of one of the student's asked liking reading, we subtract the likelihood of all three not preferring reading from the outcome of one liking reading.

$$1 \text{ (at least 1 likes reading)} - 0.343 \text{ (probability of no one liking reading)} = 0.657$$

Likewise, we can use the formula below to determine the answer:

$P \text{ (at least one success)} = 1 - P \text{ (failure in one trial)}^n$ if n represents the total number of trials

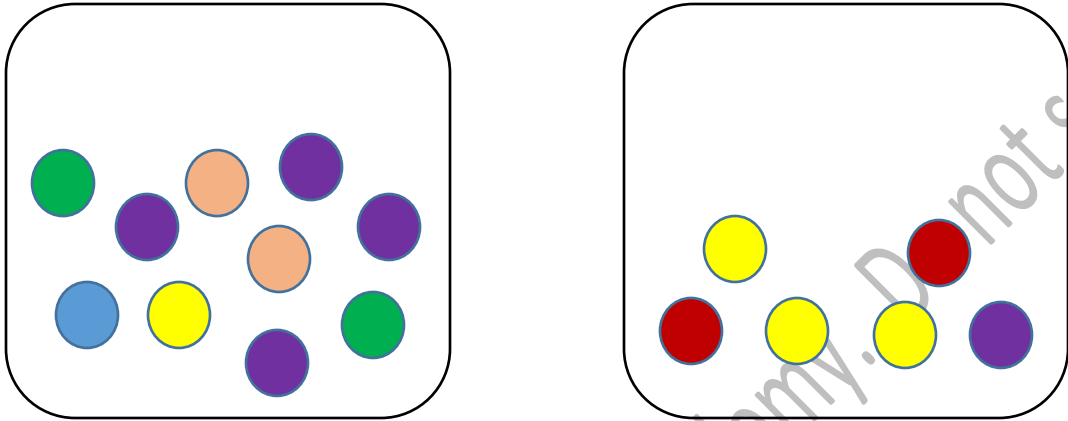
$$\text{So, } P = 1 - (0.7)^3 = 0.657$$

Both methods give us the same answer, the probability that at least one of three students asked will like reading.

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Worksheet Lesson 8

What is the probability that a both a blue and a red will be chosen if one marble is taken from each box?



In the table below, what is the probability it will take at least 4 donors to find one with type A blood?

Blood Type	Blood Type
A	O
O	B
AB	A
A	AB
A	B

If 20% of the cats are black, what is the probability that one black cat will be chosen in a random sample of 5 cats?

Lesson 9: 4th vs. 7th Grade Books: Data Collection

Review probability with your child. Remind them that probability is the likelihood of a certain outcome based on population size and the number of chances for that outcome. Then, ask them what they remember about statistics from the previous year. Remind your child that statistics is concerned with collecting and analyzing data. Statistics takes a sample from a specific population and gathers information about that random selection. Statistical data is most likely to be accurate only if the sample is representative of the population, thus, random (rather than targeted) selection is important.

For example, if you have a population of 100 people, and 50% say blue is their favorite color, 20% say green, 10% say red, 15% say yellow, and 5% say orange, a random sampling is likely to have several people who like blue. However, if you choose a targeted sample, searching for those who like orange, the numbers may change to give the impression that the population has more people who like orange. Samples should always be random to give the best chance of a representation of the population.

Ask your child to randomly choose a grade-level book they enjoy reading. Ask your child to choose 10 random pages from the book and count the words on each page, recording their answers in the table below.

Page Number	Number of Words	Page Number	Number of Words

Ask your child to use this data to determine the mean word length for each page in the book and record it below:

Next, ask your child to determine how many words are likely in the entire book by multiplying the mean by the number of pages and record their answer here:

Finally, ask your child to use graph paper to create a line graph of the number of words on each page. Keep this graph and the information above for the next lesson.

Lesson 10: 4th vs. 7th Grade Books: Data Analysis and Comparison

Remind your child of the previous lesson on statistics and review the data they collected. Then, explain that today we will be collecting a second data set and comparing the two.

Ask your child to randomly choose a 4th grade-level book. Ask your child to choose 10 random pages from the book and count the words on each page, recording their answers in the table below.

Page Number	Number of Words	Page Number	Number of Words

Ask your child to use this data to determine the mean word length for each page in the book and record it below:

Next, ask your child to determine how many words are likely in the entire book by multiplying the mean by the number of pages and record their answer here:

Then, ask your child to use a new color on the graph they created yesterday to graph their new data points. Discuss what their statistical data shows them. Ask if the number of words in a 4th grade book is generally less than that of a 7th grade book. Point out places where the data matches or crosses on the graph, where the spikes and falls in the graph match (even if the numbers are different), and any other interesting conclusions that can be drawn from the graph.