

# Chapter 1



## Manuel Acevedo: Math with Skittles

As a technology teacher/coordinator, and former math teacher and coach, I value the time I spend with students, parents, and with teachers in their classrooms. I am passionate about providing a creative and active learning school environment that promotes the importance of a STEM education in everyone's lives. I support teaching and learning that involves collaborating, planning and discussing best practices. This focal point has helped me create a school environment where every student can learn and enjoy STEM subjects.

# Math with Skittles

*Grade Level:* 6<sup>th</sup> -7<sup>th</sup>

*Content Area Topic:*

Mathematics: estimating, sorting, classifying, number relationships, computation, fractions, decimals, percents, angles, probability, interpreting tables and graphs.

*Content Area Standard(s):*

- 6.SP.B.5 Statistics & Probability: Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
- 7.SP.C.5 Statistics & Probability: Investigate chance processes and develop, use, and evaluate probability models. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around  $\frac{1}{2}$  indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
- 7.SP.C.6 Statistics & Probability: Investigate chance processes and develop, use, and evaluate probability models. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
- 7.SP.C.8 Statistics & Probability: Investigate chance processes and develop, use, and evaluate probability models. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language, identify the outcomes in the sample space which compose the event.

*Learning Objective(s):*

Students working with Skittles as manipulatives will review and reinforce their math knowledge of angles, geometry, classifying, and determining probability. They will analyze color data and calculate its probability as a fraction, decimal and percent. In addition, students will calculate the mode, mean, median, and range of the Skittles data;

they will record and interpret their data on student created tables and graphs. On the whole, students will experience hands-on learning with collecting, analyzing and interpreting data.

*Suggested Time Allotment:* 1 hour

*Sequence in Learning:*

Prior to the lesson students would have studied or reviewed angles, geometry, probability, fractions, decimals, and percents.

*Materials & Resources Needed:*

- 4 large 14 ounce Skittles bag
- 30 Dixie cups
- 30 sheets of construction paper
- 30 brown paper bags
- Computer

*Lesson Activities & Sequence:*

Show the following two Skittles video as an introduction for creating with Skittles.

- <http://www.youtube.com/watch?v=yZvGBc6TxIc>
- <http://www.youtube.com/watch?v=aHNxfhV5Qao>

- Explain to your students that they will be working with Skittles to create and review math symbols and concepts.
- Let students understand they will be allowed to eat the Skittles after they collect their data.
- Have students create a 6x2 table using Microsoft Word (see below) to record their Skittles data. Display your table on the projection screen and circulate and assist any students who need help.

Green	Orange	Purple	Red	Yellow	Total

- Give each student a Dixie cup full of Skittles and inform them to resist eating any Skittles until you give them permission.
- Have students estimate how many Skittles are in their Dixie Cup and to record their estimate on their construction paper. Review what it means to estimate.
- Write 90 degrees and 180 degrees on the white board.
- Ask students to use their Skittles to create a model of these angles on their construction paper.
- Circulate and check for understanding and provide feedback to students. Afterwards, look for students to demonstrate their models to the class using a document camera.

- After a couple of student examples, write the words ‘acute’ and ‘obtuse’ on the white board and have students create a model of these angles.
- Circulate and check for understanding and provide feedback to students. Afterwards, look for students to volunteer their models to the class using a document camera.
- Model and complete your 6x2 table for your students.
- Have students sort, count and record their different color Skittles data on their data tables and have them discuss and compare their data with their elbow partner.
- Ask how did their data compare to their partner?
- Ask were they the same or different? Why or Why not?
- Have students add the different colors and come up with a total number of Skittles to record in their table.
- Have students compare their actual total to their estimate and have a couple of students share their estimations.
- Project your 4x6 table and have students reproduce your table in their Microsoft Word document.

Color	Fraction	Decimal	Percentage
Green			
Orange			
Purple			
Red			
Yellow			

- After students have completed their new table, review with students the definition of probability and demonstrate how to find the probability with your Skittles data.
- Pour your Skittles into a small paper bag and ask your students which color had the highest probability of being chosen and which color would have the lowest probability of being selected.
- Pull out a Skittle and review your result. If it is the color with the highest probability or not, or the lowest probability or not explain to your student that probability is a measure of how likely an event occurs, not THAT THE EVENT IS CERTAIN. Review the importance of math vocabulary.
- Have students pour their Skittles in their paper bag and without looking pull out and test their probabilities. Explain to students that they should think and discuss their results and then start again. Explain that they can start eating their Skittles.
- Circulate and discuss their results.
- After a couple of minutes, model calculating probability as a fraction,

decimal and percentage. Review how to convert from fraction to decimal and to percentages with your data using your table.

- Have students complete their calculations and record them in their table. Circulate and check for understanding.
- Have a couple students share their calculations.
- Next, project a 2x4 table with range, mean, mode and median displayed.
- Review with students the definitions and how to record the mode, median, mean and range with your data.
- Have students create their final table to record their mode, median, mean and range data.

Range	
Mean	
Mode	
Median	

- Have students calculate and record their range, mean, mode, and median.
- Circulate and check for understanding and provide feedback to students. Afterwards look for students to volunteer their data.
- Have students use their data to create a bar graph using <http://nces.ed.gov/nceskids/createagraph/default.aspx> or for more advanced students, use Microsoft Excel.
- Have student email their documents for assessment.

### *Proficiency:*

- Students' models will demonstrate their content knowledge regarding angles.
- Students' tables will demonstrate their ability to calculate the probability and statistics of each color of Skittles.
- Students work will be checked for understanding by correct calculations based on their data and graphing results.

## **Feedback**

### *Teachers as Learners:*

- Hooked students with Skittles
- Video clip sparked creativity
- Hands on engaging activity
- Reviewed concepts studied previously

*Elements of Pretty Good Practice:*

- Integrated multiple math domains: geometry, probability and statistics
- Used manipulatives for student learning
- Appealed to diverse learning styles: kinesthetic, interpersonal, visual
- Parameters were clearly given before the activity

*Modifications and Adaptations*

- Refer to anchor charts during instruction
- Provide students with IEPs and ELLs with “thinking partners”
- Create Frayer Models: Meaning, Example, Non-Example, Characteristics
- Jigsaw presentations to groups

Peer Feedback

- Add Skittles to a container to calculate volume
- Use larger bags of Skittles to do data analysis with upper grades
- Additional math concepts such as array, area, perimeter, lines

*Bibliography: Internet Resources:*

[www.skittles.com](http://www.skittles.com)

<http://www.youtube.com/watch?v=yZvGBc6TxIc>

<http://www.youtube.com/watch?v=aHNxfhV5Qao>

<http://www.theteacherscorner.net/collaboration-projects/skittle-rainbow/skittles-activity.php>

<http://lessonplanspage.com/cimathwhatcolorskittles-spreadsheetgraph56-hm/>

*Student Photos*



