Curriculum Sample Template
Max. 8 Pages

Grade Level	7th Grade	**Content Area**	Math
Course Title (grades 9-12 Only)	Mathematics 7		
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	• Students understand how to work in precision partnerships effectively. • Students know how to use their math journals effectively. • Students are practiced in the experimental format of Connected Math.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	This unit is built on the framework of the SIOP Model and incorporates all 8 of the SIOP Model components. Sentence framing and precision partnering are instructional strategies which promote the use and mastery of academic language. Instructional technology is incorporated by teacher and students. The core curriculum is implemented with fidelity.		
Standard Number and Description *List the Number* and the full description for the Required Standard or Science Performance Objective listed in section A.6.*	Domain: Statistics & Probability Cluster: Use random sampling to draw inferences about a population. Standard: #2: Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For examples, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*		
Materials/Resources Needed	• Starburst lab sheets • SMART Board • Connected Math Texts: "Samples & Populations: Data and Statistics" • Exit tickets • Unit quiz		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

Lesson (add as needed)	**Instructional Strategies**	**Student Activities**
1	Vocabulary: **random sampling** **representative sampling** **inference** **valid** **invalid** Teacher presents Dan Meyer's 'Starburst' three act lesson with the SMART Board: http://threeacts.mrmeyer.com/yellowstarbursts/	1. Students add vocabulary definitions, pictures, and sentences/examples into their vocabulary journals. 2. Student partnerships are given a simple question: "How many yellow Starbursts are in 287 2-packs of candy?" 3. Students are required to generate questions/data needs to determine a reasonable answer (# of packs, # of color possibilities) and decide what information MATTERS when solving this problem. 4. After predictions are made and written down (board contest), students watch the time-lapsed Starburst video to find the answer. 5. Students complete a formative 'exit ticket' to demonstrate their understanding of random samples, how they are representative, and inference.
2	Vocabulary: **confidence interval** **confident level** **population** 1. Teacher facilitates the representative sampling challenge. 2. Share a sample size calculator tool when students eventually ask the question: How many candies do we have to count to be accurate? http://www.macorr.com/sample-size-calculator.htm 3. Teacher facilitates an active-learning lab to enhance student understanding of the usefulness of representative sampling and identify non-representative.	1. Students add vocabulary definitions, pictures, and sentences/examples into their vocabulary journals. 2. Students are divided into teams of four and presented with a challenge: which team can most quickly complete a representative sampling? 3. Students will enter their sampling parameters (confidence interval, confidence level, and population 4. Students rotate through active-learning lab 'sampling stations' to preview whole populations and their samples and determine whether the sampling method produced a representative or non-representative sample. Students complete station reflections through which they explain their reasoning. 5. Students complete a formative 'exit ticket' to demonstrate their understanding of random samples, how they are representative, and inference.

3	Vocabulary: **convenience sampling** **systematic sampling** **voluntary-response sampling** **random sampling** 1. Teacher presents a similar lesson from the prior day using a short video from http://learnzillion.com/lessons/1848-make-inferences-about-a-population-by-analyzing-random-samples to help students refine their thinking about valid vs. invalid inferences of data samples. 2. Guide students through Investigation #2 in Connected Math's Samples & Populations: Data and Statistics investigation. 3. Present new vocabulary terms and prompt students to add new terms to vocabulary journal. 4. Facilitate the 2.3 'Choosing Random Samples' activities B.1 and C.1 in Connected Math to help students apply knowledge of sampling and create visual representations to summarize their knowledge.	1. Students will watch the short video as a review of the prior day and review their vocabulary journals. 2. Review the 'Honesty Survey in 2.1 and devise a sampling plan. 3. Add new vocabulary terms to journals. 4. Using 2.3, estimate sleep and movie viewing habits of 100 students and create box plots representing distributions. 5. Students will write summaries about variability, distribution, and sampling and will draw conclusions about their data.
4	1. Refer students to prior day's data for sleeping and movie-viewing. 2. Guide student partnerships through an exploration of sample size as they quantify various samples of their entire data sets (5 students, 10 students, 20 students, 50 students)	1. Use prior day's data to experiment with the impact of sampling size on inference. 2. Create graphs representing their findings. 3. Write a summary that provides an analysis of the impact that sample size has on estimation.
5	1. Provide 'Applications' from Connected Math 2.4 that offers real world descriptions (#1-17) of sampling methods, sampling sizes, and data collection. 2. Give summative assessment for unit.	1. Analyze the Connected Math 2.4 #1-17 real world descriptions and provide written evaluations of the methods and strategies offered that identifies the strength and weakness of each situation. Students will also generate potential solutions to address weaknesses found in the descriptions. 2. Take the summative assessment.

Summative Assessment Items: *Attach here.*

Inference from Data Quiz

Domain: Statistics and Probability

Cluster: Use random sampling to draw inferences about a population.

Standard: Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

Essential Student Question: Can you use random sample data to make inferences about a whole population?

1. As the student council president, Alejandra is responsible for ordering pizza for the students' end-of-year party. She and her officers collected randomly-sampled, representative data from four of the 36 classrooms to determine the preference of the students. View their data below and identify a valid inference that can be drawn from the data:

class officer	cheese	pepperoni	supreme	total
#1: President	10	20	10	40
#2: Vice President	5	23	10	45
#3: Secretary	1	40	2	43
#4: Treasurer	2	36	10	48

a. Students across the campus would prefer supreme to cheese pizza.
b. Students across the campus would prefer pepperoni to cheese.
c. Students across the campus don't demonstrate a significant preference in the sampled data.
d. Students across the campus do not like cheese pizza.

2. Currently, 135 kids live in your neighborhood. Suppose that you want to take a survey of the neighborhood kids to determine the best day to have the annual block party when the most people can attend. Circle the best sample size below, and then write a brief explanation about why that is the best choice.

a. 25
b. 78
c. 110
d. 135

3. Jesse's teacher, Ms. Aguilar, has a stick with every student's name on it in a jar at the front of the class. When she asks questions to check for understanding, she pulls a stick out of the jar and calls on the student whose name is on the stick. Once a name is chosen, Ms. Aguilar puts the stick aside. There are 19 girls and 11 boys in the class. The teacher calls on ten students during science class, and 9 of them are girls. How would you describe this result, and why?

a. This is a surprising result, as one would expect nearly half of the sticks to be for boys.
b. This is a surprising result, as one would expect two-thirds of the sticks to be for boys.
c. This is not surprising, as the class has more girls in it than boys.
d. This is not a surprising result, as the stick method is a completely random way to select students.

4. A local radio station played two brand-new songs from local bands, then they invited listeners to either call in or text the station to vote for their favorite one. The winner of the call-in contest will be awarded a recording contract with a major label. The contest was open for 24 hours. After 2,134 calls and 30,145 text votes, which statement best summarizes the validity of the sample data the station is collecting?
a. Texting produces more valid results because it is not a voluntary-response sampling method.
b. Calling produces more valid results because it is provides a more random sample.
c. The texting method of polling provides more validity because it captures more participation.
d. The calling method provides more validity because people have to ***really*** care to phone in until they get through.

5. In the above scenario, which variable would invalidate the 32,279 votes cast?
a. One band had a texting network of 20,000 fans already established . . . but the other band did not.
b. One band provided phones to its members and their families so that they could vote during the contest.
c. One band has three members and the other has eight.
d. One band is originally from a part of town that experienced massive cell service loss for 5 minutes of the competition.

6. Why is data often collected from a sample rather than an entire population?

7-10. For each strength and weakness below, provide the name of the sampling method being used. Your choices are: **convenience**, **voluntary-response**, **random**, and **systematic**.

name of sampling method:	**strength:**	**weakness:**
7.	The population being sampled is readily available to the investigator.	The population being sampled may not be truly representative of the whole group.
8.	Gives a representative sampling of data.	Requires a complete list of population members.
9.	Inexpensive and simple way to collect data.	Can provide skewed data based on who chooses to participate.
10.	Tends to create representative data if properly managed.	Requires more effort than a simple random sampling to ensure that system 'skips' don't occur.

Inference from Data Quiz Answer Key

1. B
2. C; and the written answer should reflect an understanding that it is unnecessary work to sample every single member of the population AND that validity tends to increase with sample size.
3. A
4. C
5. A
6. This should communicate the understanding that sampling is faster, cheaper, and easier, and when conducted properly (with attention to methods and sample size), yields relatively valid results.
7. convenience
8. random
9. voluntary-response
10. Systematic

Inference from Data Quiz Scoring Guide:

10 questions weighted at 1 points each **10 points total**

Raw score_____X = ____10_____/100 points

The 100 points possible assessment will reflect the school's grading scale:

90 -100 = A – Mastery

80 – 89 = B - Mastery

70 – 79 = C – Needs Screening for Remediation

60 – 69 = D – Needs Remediation

0 – 59 = F – Needs Intensive Remediation