NCTM Regionals 2012 Presentation, Dallas, Texas

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Dig into Grade 7 Statistics and Probability Standards with Technology

Friday, October 12, 2012: 03:30 PM - 04:30 PM, Convention Center, Room C142

The next page will give you some useful *TinkerPlots* getting-started tips. The final pages show you 7th grade CCSS Statistics and Probability standards.

These files were displayed in today's talk. You will need *TinkerPlots* software in order to open them. (See the next page for instructions on downloading a preview version of *TinkerPlots*.):

- Download blood type simulation *TinkerPlots* file. (http://www.keycurriculum.com/docs/PDF/Conference-Downloads/JNoah/BloodTypeSim.tp)
- Download fish sample *TinkerPlots* file. (http://www.keycurriculum.com/docs/PDF/Conference-Downloads/JNoah/FishSample1.tp)
- Download fish population *TinkerPlots* file. (http://www.keycurriculum.com/docs/PDF/Conference-Downloads/JNoah/FishPopulation2.tp)

These activities were referenced in the talk:

- Fish-Length Distributions, downloadable at http://www.keycurriculum.com/resources/tinkerplots-resources/free-activities-and-resources/data-analysis-and-modeling-activities
- Modeling Probability tutorial (difference of two die), access through the software at **Help | TinkerPlots Tutorials**, or at http://www.keycurriculum.com/resources/tinkerplots-resources/tutorials/modeling-probability
- Sum of Two Dice, downloadable at http://www.keycurriculum.com/resources/tinkerplots-resources/free-activities-and-resources/tinkerplots-randomness-and-chance-activities

Get Started with *TinkerPlots®*!

TinkerPlots® Dynamic Data Exploration is a powerful tool that's fun and effective for exploring concepts in data analysis and probability. It's great for investigating social science and science data as well! Here are some suggestions on how to get started using *TinkerPlots*:

1. **Purchase *TinkerPlots* or download the free trial version** at: www.keycurriculum.com/tinkerplots.

2. **Watch Instructional Movies and Tutorials**
   - Learn how to navigate the software, add data, or make common graphs at: www.keycurriculum.com/resources/tinkerplots.
   - Movies can also be accessed from *TinkerPlots* by selecting **Help | TinkerPlots Movies**.
   - Tutorials can also be accessed by selecting **Help | TinkerPlots Tutorials.**

3. **Browse Activities:**
   - Check out the free *TinkerPlots* activities at: www.keycurriculum.com/resources/tinkerplots.
   - Activity modules are available for purchase at: www.keycurriculum.com/tinkerplots-activity-modules.
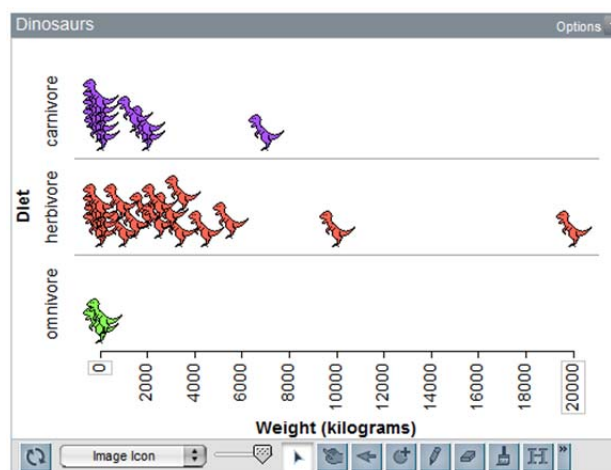
4. **Explore Data Sets:**
   - Access data sets from *TinkerPlots* by selecting **File | Open Sample Document**.

5. **View Webinars:**
   - Register for an upcoming webinar, or watch an archived webinar at: www.keycurriculum.com/webinars.

6. **Take an Online Course:**
   - Register for a six-week moderated online course at: www.keycurriculum.com/online-courses.

CCSS Standards—7th Grade—Statistics & Probability

Use random sampling to draw inferences about a population.

- **7.SP.1.** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

- **7.SP.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 example, 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.*

Draw informal comparative inferences about two populations.

- **7.SP.3.** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*

- **7.SP.4.** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*

Investigate chance processes and develop, use, and evaluate probability models.

- **7.SP.5.** 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 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

- **7.SP.6.** 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. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*

- **7.SP.7.** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

  o Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*

  o Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*

- **7.SP.8.** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

  o Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

  o Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

  o Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*