Leapfrog Program
Week 2
Course Title: Treasure Maps

Course Description
Making maps, or cartography, is a process that involves many different geometry skills. Adding the mystery of buried treasure makes the process even more fun! Students apply principles of geometry and concepts of cartography to create their own treasure maps and use classmates' maps to find their treasure!

Essential Questions
- How is geometry used in the world around us?
- What math skills and tools are needed to create a map?
- Why are some maps easier to read than others?
- How is a treasure map like a puzzle?

Outcomes
Upon successful completion of this course, students will have:

a. Observed and discussed examples of maps identifying the geometry principles involved
b. Researched the methods, history, and tools of cartography
c. Created maps of increasing complexity
d. Identified and discussed the challenges of creating accurate maps and how to overcome those challenges
e. Measured lines, areas, and angles
f. Evaluated each other's maps and provided constructive suggestions to each other to improve the map's accuracy
g. Created a treasure map as a final project applying learned geometric principles and cartography methods

Instructional Strategies
"Treasure Maps" will engage young students in a variety of hands-on instructional settings and authentic learning experiences including: class discussion, read alouds, individual and partner exploration, classification/sorting, flexible grouping, individual and partner projects ("surveying" land, sketching maps, calculating scale, determining directions using a compass, etc.), and a culminating individual treasure map project (students will create their own "lost islands" in a plastic container using sand and other materials and will create an individual "treasure map" of their own island). Each assignment for this course will, in part, be based upon students' interests and abilities to ensure an appropriate academic challenge and pacing for each student. Small group activities will make use of "flexible groups" – meaning that students will have the opportunity to work with peers at the same level – so assignments may look slightly different for each group depending on specific interests and abilities.

Resources and Materials
Books

- Chancellor, D. (2004). *Maps and Mapping*. Kingfisher Publications. ISBN: 978-0753461648
- Cooke, T. (2010). *Maps and Exploration*. Gareth Steven Publishing. ISBN: 978-1433935121
- Ganeri, A. (1997). *The story of maps and navigation.* Oxford University Press. ISBN: 978-0195214109
- Gonzales, D. (2008). *Are we there yet? Using map scales.* Capstone Press. ISBN: 978-1429628792

- Johnson, S. (1999). *Mapping the world.* Atheneum Books for Young Readers. ISBN: 978-0689818134
- Lomas, S. (2004). *Maps and Symbols.* Blackbirch Press. ISBN: 978-1410301130
- Murphy, S. (2004). *Treasure Map.* HarperCollins. ISBN: 978-0064467384
- Owen, J. (2007). *Lost treasures of the pirates of the Caribbean.* Simon & Schuster Books for Young Readers. ISBN: 978-1416939603
- Sweeney, J. (1996). *Me on the map.* Dragonfly Books. ISBN: 978-0517885574
- Walsh, K. (2004). *Map Math*. Rourke Publishing. ISBN: 978-1400744893

Web sites

- Map Quest. <www.mapquest.com> *This site contains both political maps and satellite images of the world. Students will use this site to investigate common "street maps" and the symbols/labels that are used to easily convey information to the user.*
- Geography for Kids: United States of America Map Game. <http://www.kidsgeo.com/geography-games/united-states-america-map-game.php> *This site contains an interactive game where students are presented states and must decide where they fit on the map of the United States. This game will be used to practice reading maps and locating specific states.*

Other Media

- DVD: *A History of Maps*. (2004). Schlessinger Media. ISBN: 157225906X

Materials

- Pencils, Erasers, Colored Pencils, Crayons, Graph Paper, Ruler, Protractor, Compass, Notebook, 2-pocket folder
- Lost Island Project: Large plastic container, sand, small "trees" and other landscape items, and "treasure"
- Daily snack and water bottle
- Various example maps (world, city, park, blueprints, astronomical maps, topographic maps, etc.)

Student Assessment

- **Pre-Assessment**
  On the first day of the course students will create a "bedroom map," using whatever prior knowledge they have about maps, size/scale, cardinal directions, symbols, etc. Maps will be assessed looking for the following: use of a compass rose, symbols, labels, a scale, object placement, and map orientation. Content modifications to the course may be made based on the level of precision included in "bedroom maps" and the inclusion/accuracy of the previously mentioned components.

- **Documentation of Learning**
  Daily documentation of learning will be used to ensure accurate assessment of each student's learning throughout the course. Daily assessment will include a journal entry (using the "writer's workshop" model so that students can write at their own level and individually conference with the instructor/assistant to share or explain ideas) in which they will answer critical thinking questions (e.g. "Why do people need maps?" or "What parts of a map make it easy to understand?"). Additionally, the instructor and teaching assistant will also keep a daily log of anecdotal notes about each student that will include information about social/emotional development (working with peers, following directions, etc.) as well as academic performance (participation in class discussion, responses to questions, ideas conveyed through activities, etc.) that will be communicated through the final evaluation. Students will also create various maps will also be used for assessment as well.

- **Post-Assessment**
  To assess students' understandings of cartography (map drawing) and the basic mathematical principles that are necessary to create accurate maps, each student will have the opportunity to create his/her own "lost island" using plastic containers, sand, various landscaping (e.g. fish tank plants and other "pretend" vegetation), and a hidden treasure. After creating an individual "lost island" students will record measurements of the objects and distances on the island in order to create a culminating "treasure map." The

treasure map will then be used to create a series of "clues" (e.g. "Start at the large rock, turn 20° West and take 10 paces to the tree stump," etc.) to incorporate basic navigation techniques so that a peer can try to locate the "buried treasure" in the sand.

Schedule

Date	Topic(s)	In-class Activities	Documentation of Learning/Assessment
Mon. July 18	• Introduction to maps, uses of maps, and common map features	• Introductions, expectations • Pre-Assessment (bedroom map) • Read aloud *Me on the Map* • Class discussion of uses of maps • Chart "What we know about maps" • Gallery-walk and discussion of common elements in "my bedroom map" • Group activity: "What are the important parts of a map?" (groups observe a variety of maps to find similar traits and then sort maps based on class-generated characteristics) • Read aloud selection from *Lost Treasures of the Pirates of the Caribbean* • Journal Entry: "Why do we need maps? What kinds of maps do people need?" • Locate SSPP school on *mapquest*, use street names and other features to create a "neighborhood map" of the school	• Pre-Assessment (bedroom map) • Anecdotal Notes • Journal Entry
Tues. July 19	• " **N**ever, **E**at, **S**oggy, **W**heaties" (map directionality and how to use a compass to navigate)	• Read aloud "The Compass" from *Map Math* • Students explore properties of a compass • Journal entry "What does a compass do?" • Students practice following simple directions (e.g. turn 90° East) using a compass • Calculating angles using a protractor • Measuring angles to follow given directions • Create a "playground map" and label the "degrees" between objects (e.g. The 4-square is 60° West of the slide)	• Anecdotal Notes • Journal Entry • "Playground map"
Wed. July 20	• Big or Small? Determining an accurate scale	• Define "scale" and decide when it would be useful • Read aloud *Are we there yet? Using Map Scales* • Calculating Scale • Apply scale factors to create a full-class map of the United States • Create individual "lost island" models using sand and "landscape" materials	• Anecdotal Notes • Journal Entry • "Lost Island" models

Thur. July 21	• Creating a Treasure Map	• Read aloud selection from *Lost Treasures of the Pirates of the Caribbean* • Students measure and record heights and distances between objects in their "lost island" • Students decide how to create a treasure map of their "lost island" • Sketch/create "lost island" maps using appropriate scale factors and cardinal directions	• Anecdotal Notes • Journal Entry • Completed Treasure Map
Fri. July 22	• North or South? Left or Right? Creating Clues to find Buried Treasure	• Read aloud *Treasure Map* • Class discussion about how to write effective "clues" for finding treasure • Students write a series of "clues" using "degrees," "angles," and "distances" from their maps • Students follow a partner's clues to decide if they make sense • Parent *EXPO!* "Treasure Hunt"	• Anecdotal Notes • Post-Assessment (Treasure Map and Clues)

CTD Statement on Third-Party Web Sites

Instructors are required to thoroughly review any third-party web sites they intend to use in their courses for inappropriate content. However, because web content continuously changes, CTD disclaims any responsibility for any of the content contained on third-party web sites used in course materials. If you become aware of anything that may be inappropriate, please notify CTD staff immediately.