# Scout: _____

# Numbers Don't Lie

This module is designed to help you explore how math affects your life each day.

| 1. Choose A or B or C or D and complete ALL the requirements. |
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| A. Watch about three hours total math-related shows or documentaries that involve scientific models and modeling, physics, sports equipment design, bridge building, or cryptography. Then do the following: |
| (1) Make a list of at least two questions or ideas from each show. |
| (2) Discuss two of the questions or ideas with your counselor. |
| B. Research (about three hours total) several websites that discuss and explain cryptography or the discoveries of people who worked extensively with cryptography. Then do the following: |
| (1) List and record the URLs of the websites you visited and the major topics covered on the websites you visited. |
| (2) Discuss with your counselor how cryptography is used in the military and in everyday life and how a cryptographer uses mathematics. |
| C. Read at least three articles (about three hours total) about physics, math, modeling, or cryptography. You may wish to read about how technology and engineering are changing sports equipment, how and why triangles are used in construction, bridge building, engineering, climate and/or weather models, how banks keep information secure, or about the stock market. Then do the following: |
| (1) Make a list of at least two questions or ideas from each article. |
| (2) Discuss two of the questions or ideas with your counselor. |
| D. Do a combination of reading, watching, or researching (about three hours total). Then do the following: |
| (1) Make a list of at least two questions or ideas from each article, website, or show. |
| (2) Discuss two of the questions or questions with your counselor. |

| Date | | Completed A, B, C or D | |
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| 2. Choose ONE STEM field of interest from the following list that you have not completed (American Business, Chess, Computers, Drafting, Entrepreneurship, Orienteering, Personal Management, Radio, Surveying, Weather). Complete ALL the requirements for a Venturing STEM exploration in that field. After completion, discuss with your counselor how the Venturing STEM exploration you completed uses mathematics. |
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| Date | | Field | |
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| 3. Choose TWO from A or B or C or D or E and complete ALL the requirements. |
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| A. Calculate your horsepower when you run up a flight of stairs. |
| (1) How does your horsepower compare to the power of a horse? |
| (2) How does your horsepower compare to the horsepower of your favorite car? |
| Share your calculations with your counselor, and discuss what you learned about horsepower. |
| B. Attend at least two track, cross-country, or swim meets. |
| (1) For each meet, time at least three racers. |
| (2) Calculate the average speed of the racers you timed. |
| (3) Compare the average speeds of your racers to each other, to the official time, and to their times at the two meets you attended. |
| Share your calculations with your counselor, and discuss your conclusions about the racers' strengths and weaknesses. |
| C. Attend a soccer, baseball, softball, or basketball game. Choose two players and keep track of their efforts during the game. Calculate their statistics using the following as examples: |
| (1) Soccer - Goals, assists, corner kicks, keeper saves, fouls, offsides. |
| (2) Baseball or softball - Batting average, runs batted in, fielding statistics, pitching statistics. |
| (3) Basketball - Points, baskets attempted, rebounds, steals, turnovers, and blocked shots. |
| Share your calculations with your counselor, and discuss your conclusions about the players' strengths and weaknesses. |

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| D. Attend a football game or watch one on TV.  Keep track of the efforts of your favorite team during the game. Calculate your team's statistics using the following as examples: |
| (1) Kicks/punts |
| (a) Kickoff - Kick return yards |
| (b) Punt - Number, yards |
| (c) Field goals - Attempted, percent completed, yards |
| (d) Extra point - Attempted, percent completed |
| (2) Offense |
| (a) Number of first downs |
| (b) Forward passes - Attempted, percent completed, total length of passes, longest pass, number and length of passes caught by each receiver, yardage gained by each receiver after catching a pass |
| (c) Running plays - Number, yards gained or lost for each run, longest run from scrimmage line, total yards gained or lost, and number of touchdowns |
| (3) Defense - Number of quarterback sacks, interceptions turnovers, and safeties. |
| Share your calculations with your counselor, and discuss your conclusions about your team's strengths and weaknesses. |
| E. How starry are your nights? Participate in a star count to find out. Afterward, share your results with your counselor. |
| (1) Visit NASA's Student Observation Network website for instructions on performing a star count. |
| (2) Do a star count on five clear nights at the same time each night. |
| (3) Report your results on NASA's Student Observation Network website and see how your data compares to others. |

| Date | | Completed Two from A, B, C, D or E | |
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| 4. Do ALL of the following. |
| A. Investigate your calculator and explore the different functions. |
| B. Discuss the functions, abilities, and limitations of your calculator with your counselor. Talk about how these affect what you can and cannot do with a calculator. |

| Date | |
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| 5. Discuss with your counselor how math affects your everyday life. |

| Date | |
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