How Much Water Do We Usually Get Per Year?

Visit: http://climate.k-state.edu/precip/county/

1. Select a county to complete your study: _____

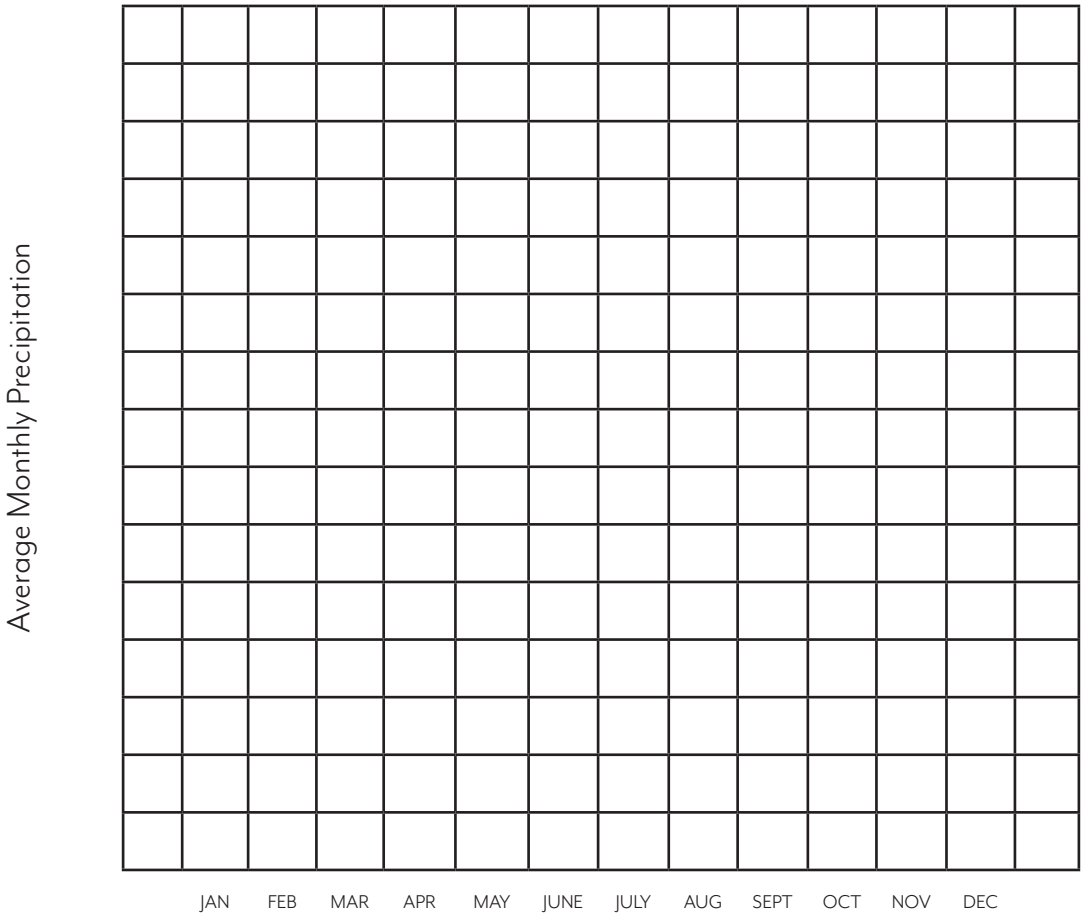
   How much rain did that county get in the last 5 years?

Year	In. of Rain.
2017	
2016	
2015	
2014	
2013	
Average: (total in. of rain / 5)	

2. When did the rain come? Precipitation that we receive as snow in December helps but doesn't have as much direct impact as rain during the growing season.

	2017	2016	2015	2014	2013	Monthly
Average						
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						
Yearly Average						

3. Graph your data. Create a graph showing your average monthly precipitation over the year, January to December.



4. The planting season for corn is from May through September. Add up the total amount of average precipitation you would get in those months. It will take approximately 22 in. Do you have enough?

What other factors are at play? Brainstorm potential factors that can affect water in your area.
Hint: Think about what might affect water moving through the water cycle.

Type of Irrigation: https://water.usgs.gov/edu/wuir.html
Use the resources on the site above to help you determine the pros and cons of each type of irrigation.

Flood Irrigation		Drip Irrigation		Spray Irrigation	
Pro	Con	Pro	Con	Pro	Con

Problem: You need to get water to your crops but you want to do it efficiently. Design an irrigation system that will allow you to make up the deficiency of water you discovered that must be covered for you to get a good crop.

Constraints: Use data collected previously to outline the constraints you have in your geographic area (wind, temperature, topography, cost, distance to pump, etc.).

Rubric: The following rubric is to help guide you in your designing process. Remember, all good designs have been through multiple prototypes, ideas, and drafts. You have already done some research, so now go design.

	Advanced	**Proficient**	**Developing**	**Beginning**
Brainstorming	Generated multiple possible solutions that lay within all outlined constraints, based on scientific or engineering justifications stemmed from initial research or reverse engineering.	Multiple possible solutions without initial research, all possible solutions are within the initial constraints.	Multiple possible solutions within constrains that do not address all of the concerns outlined. Little scientific or engineering justification.	A single possible solution is presented. Options do not meet constraints. No sound scientific of engineering justification for options.
Evaluating possibilities	Determined to measure the success of possible solutions, fully documents processes followed to create and evaluate options.	Documentation of measurement of success that outlines discrete differences between possible solutions.	Measurement of success does not allow for differentiation between possible solutions but is documented.	Minimal testing is completed to discriminate between possible options.
Selecting preliminary designs	Analyzes preliminary data collected on possible solutions and chooses the best element or combination of elements based on data and/or research that objectively supports selection. Takes into consideration possible tradeoffs in options.	Analyzes data collected on possible solutions and chooses an element or combination of elements based on data and/or research that objectively supports selection. Potential tradeoffs not considered.	Data is not used systematically for initial decisions. Chooses design options that do not meet the initial constraints of project.	No data collected to support decisions made during the process. No logical for selection
Final prototype development	Final prototype actually does what it is designed to do. Has measureable success when demonstrated. Decision making processes are defended with data and reasoning. Prototype effectively communicates the form of the detailed final design, and exhibits quality/craftsmanship.	Prototype does what it is designed to do. Has demonstrated performance that could be optimized with additional experimentation. Decision making is based on data and is effectively demonstrated.	Meets most but not all constraints. Design provides limited performance. Design not fully documented or explained.	Prototype does not meet constraints. Basic function of design not completed. Final design not communicated.