DATA *Nugget*

Does more rain make healthy bison babies?
Featured scientist: Jeff Taylor from the Konza Prairie Biological Station
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Research Background:

The North American Bison is an important species for the prairie ecosystem. They are a **keystone species**, which means their presence in the ecosystem affects many other species around them. For example, they roll on the ground, creating wallows. Those wallows can fill up with water and create a mini marsh ecosystem, complete with aquatic plants and animals. They also eat certain kinds of food – especially prairie grasses. What bison don't eat are wildflowers, so where bison graze there will be more flowers present than in the areas avoided by bison.

A bison mom and her calf.

This affects many insects, especially the pollinators that are attracted to the prairie wildflowers that are abundant in in the bison area.

Not only do bison affect their environment, but they are also affected by it. Because bison eat grass, they often move around because the tastiest meals might be scattered in different areas of the prairie. Also, as bison graze down the grass in one area they will leave it in search of a new place to find food. The amount of food available is largely dependent upon the amount of rain the area has received. The prairie ecosystem is a large complex puzzle with rain and bison being the main factors affecting life there.

The Konza Prairie Biological Station in central Kansas has a herd of 300 bison. Scientists study how the bison affect the prairie, and how the prairie affects the bison. Jeff started at Konza as a student, and today he is the bison herd manager. As herd manager, if is Jeff's duty to track the health of the herd, as well as the prairie.

One of the main environmental factors that affect the prairie's health is rainfall. The more rain that falls, the more plants that grow on the prairie. This also means that in

wetter years there is more food for bison to eat. Heavier bison survive winters better, and then may have more energy saved up to have babies in the following spring. Jeff wanted to know if a wet summer would actually lead to healthier bison babies, called **calves**, the following year.

Jeff and other scientists collect data on the bison herd every year, including the bison calves. Every October, all the bison in the Konza Prairie herd are rounded up and weighed. Since most of the bison calves are born in April or May, they are about 6 months old by the time are weighed. The older and the healthier the calf is, the more it weighs. Very young calves, including those born late in the year, may be small and light, and because of this they may have a difficult time surviving the winter.

Jeff also collects data on how much rain and snow, called **precipitation**, the prairie receives every year. Precipitation is measured daily at the biological station and then averaged for each year. Precipitation is important because it plays a direct role in how well the plants grow.

Jeff and a herd of bison on the Konza prairie.

Scientific Question: Does prairie rainfall affect the health of the following year's calves?

What is the hypothesis? Find the hypothesis in the Research Background and underline it. A hypothesis is a proposed explanation for an observation, which can then be tested with experimentation or other types of studies.

Scientific Data:

**Use the data below to answer the scientific question:**

YEAR	PREVIOUS YEARS' PRECIPITATION (inches)	AVERAGE CALF WEIGHT (pounds)
2000	26.6	281
2001	20.6	277
2002	25.9	283
2003	24.9	266
2006	36.9	336
2007	29.0	282
2010	35.4	316
2011	29.3	310
2012	32.0	321
2014	29.7	274

What data will you graph to answer the question?

Independent variable: _____

Dependent variable: _____

Below is a graph of the data: Identify any changes, trends, or differences you see in your graph. Draw arrows pointing out what you see, and write one sentence describing what you see next to each arrow.
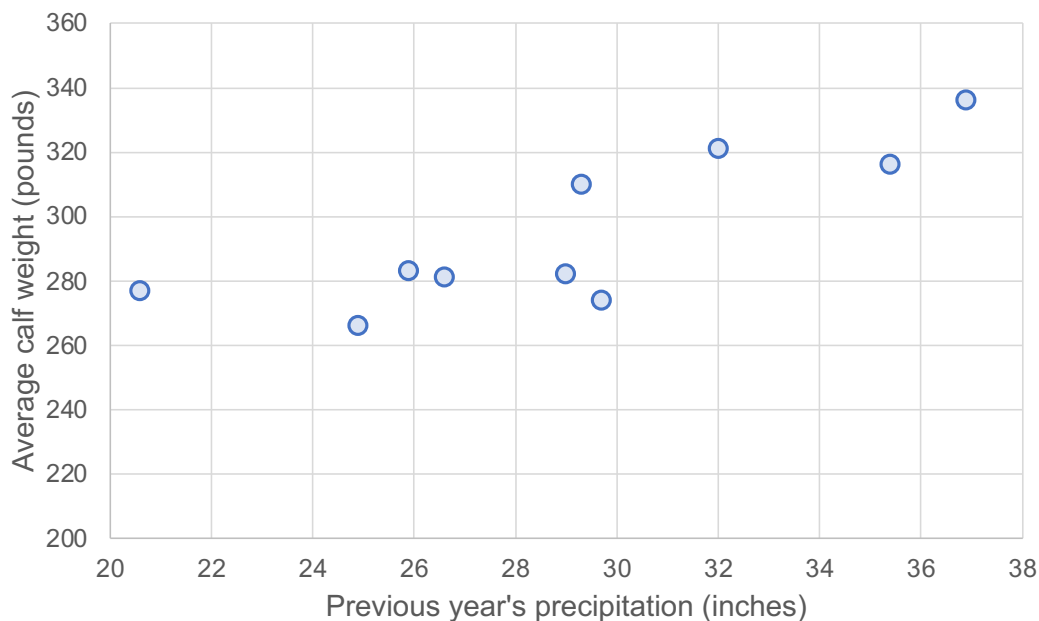
Interpret the data:

Make a claim that answers the scientific question, does prairie rainfall affect the health of the following year's calves?

What evidence was used to write your claim? Reference specific parts of the table or graph.

Explain your reasoning and why the evidence supports your claim. Connect the data back to what you learned about how precipitation affects the health of the prairie, and in turn, bison.

Did the data support Jeff's hypothesis? Use evidence to explain why or why not. If you feel the data are inconclusive, explain why.

Your next steps as a scientist: Science is an ongoing process. What new question(s) should be investigated to build on Jeff's research? How do your questions build on the research that has already been done?