Name: _____   Period: _____   Date: _____

Corn Graphs and Maths - World of Corn 2020

Directions: Students will use National Corn Growers Association's *World of Corn 2020* infographic to answer the following questions. This assignment is to help students find and interpret data from tables and graphs. Useful formulas can be found on the last page. Be sure to show your work in the spaces provided.

1. What is the percent increase in the number of **bushels per acre harvested** from 1929 to 2019?

2. What is the percent increase in the number of **acres harvested** from 2018 to 2019?

3. Out of **All U.S. Crop Acres Harvested**, what percentage was **corn (grain)** in 2019?

4. Based on the **Components of Yellow Dent Corn**, what percentage of the kernel is **starch**?

5. What is the **fat (oil)** to **protein** to **carbohydrate (starch)** ratio of **yellow dent corn**?

6. What is the percentage of **corn acres harvested** out of **corn acres planted**?

7. Using the number of **corn bushels produced** and the **corn crop value** in 2019, determine the **average price per bushel.**

8. Using the **nutritional label** (located on last page) from a 12-ounce can of Coca-Cola (www.coca-colaproductsfacts.com), how many cans of Coca-Cola can be made from **1 bushel of corn** when the amount of added sugars is **high fructose corn syrup**? Use 453.592 grams = 1 pound

9. In 2019, which **state** had the highest **average yield in bushels/acre**? Which **state** had the largest **total production** of corn?

   a. Highest average yield: _____ bushels/acre   State: _____

   b. Largest total production: _____ 1,000 bushels   State: _____

10. Which year saw the **highest price per bushel of corn**? Year: _____   Price: _____

11. What is the **Total World Corn Production** from 2019-2020 in millions of bushels? _____

12. Using the number of **bushels produced from 2019-2020**, what percentage of U.S. corn production is **exported** to other countries?

13. Looking at the **U.S. Corn Exports from 1999-2019**, why was **2012** the lowest year for corn exports?

14. Looking at the **Corn Processed by Segment 1999 – 2019**, what is the difference in millions of bushels in **Feed & Residual** between the highest processed year and the lowest processed year?

       Highest Year: _____,   millions of bushels _____

       Lowest Year: _____,   millions of bushels _____

       Difference: _____ millions of bushels

15. Looking at the **Corn Usage by Segment 2019** dot graph, determine how many **millions of bushels each dot represents**. Hint: make this easy on yourself. Look at a segment that has a nice whole number or percentage, like **sweeteners**.

16. Looking at **High-Fructose Corn Syrup Usage 1989 – 2019**, we see that peak usage was in 1999 and has slowly lowered each year to 2019. What is the **average decrease in HFCS usage**, in millions of bushels per year, in the 12 years between 1999 and 2019?

17. Looking at the **Sweetener Usage 1989 – 2019**, we see that the lowest level of usage was in 1989. If the use of sweeteners **increased at an average of 11.214 million bushels per year** for fourteen years, how many bushels of corn were used as sweeteners in 2019?

18. What percentage of U**.S. ethanol production** comes from **Iowa**?

19. What percentage of U**.S. ethanol production** comes from **Kansas**?

20. What percentage of planted **Biotech Corn Acreage in 2019** has **stacked traits**?

2 Question BonusUse the Corn Fed by Species 2006 – 2019 graph.

Conversion factors: 56 pounds = 1 bushel   2204.62 pounds = 1 metric ton

21. Determine how much **grain, in pounds**, an average chicken consumes over its life if there were **9.2 billion chickens** in 2019.

22. Determine how much **grain, in pounds**, an average cow consumes over its life if there were **39 million cows** in 2019.

Helpful Mathematical Formulas

- $Percent\ Increase\ = \frac{End\ Value - Starting\ Value}{Starting\ Value} \times 100\%$

- $Percent = \frac{Individual\ Value}{Total\ Value} \times 100\%$

- Ratios: Find the smallest value and divide that number into the other numbers. It is OK to have final values with decimals.

   Example → 4.5 red : 18 blue : 9 green = $\frac{4.5}{4.5}\ red : \frac{18}{4.5}\ blue : \frac{9}{4.5}$ green = 1 red : 4 blue : 2 green

- Conversions: Use conversion factors and dimensional analysis to find your answer.

   12 inches = 1 foot   2.54 centimeters = 1 inch

   o Example Question: How many inches are in 3.65 feet?

   $3.65\ feet\ x\ \frac{12\ inches}{1\ foot} = 43.8\ inches$

   o Example Question: How many centimeters are in 3.65 feet?

   $3.65\ feet\ x\ \frac{12\ inches}{1\ foot}\ x\ \frac{2.54\ centimeters}{1\ inch} = 111\ centimeters$

Nutrition Facts

1 Serving Per Container

Serving Size	**1 Can**

Amount Per Serving

Calories	**140**

	% Daily Value
Total Fat 0g	**0%**
Sodium 45mg	**2%**
Total Carbohydrate 39g	**14%**
Total Sugars 39g	
Includes 39g Added Sugars	**78%**
Cholesterol 0mg	**0%**
Protein 0g	
Vitamin D	0%
Calcium	0%
Iron	0%
Potassium	0%

Not a significant source of saturated fat, trans fat, cholesterol, dietary fiber, vitamin D, calcium, iron and potassium.