

Wyoming State FFA 2016 KEY
Agricultural Technology and Mechanical Systems
Team Activity: Animal Systems

Event Format:

A. Equipment Provided:

1. Calculator – participants will be allowed to provide their own.
2. Scratch paper for problem solving.

B. Objective:

The team activity evaluates the ability of team members to work together while using decision-making and problem analysis skills by applying concepts taught in horticulture and plant sciences.

1. Members of a team work together cooperatively to complete this section.
2. Sixty (60) minutes are allowed for completion of the team activity. At the end of the activity, each team submits the completed documents to be scored.
3. The team activity involves the use of construction skills and the resource information.
4. The team activity has a maximum value of 400 points per team and is only included in the team score
5. All team members must be involved in the team activity to receive credit. If a team has two or less participants no credit will be allowed in the team portion of the event.

Directions:

Work as a group to complete parts A, B, C, D, and E. While you are working you will be evaluated by an observer on your ability to work as a team. Your team will have 60 minutes to create a computer generated report while utilizing materials and equipment provided to solve the problems below. Your document must include a cover page with title, state name, a description of the activity, a description of each team member's role, calculations/ diagrams identified by instructions and correlated with the activity theme. You must also include any and all justification(s) about how you reached your answer, as well as proper formatting throughout the typed document, including: typed Times New Roman 12pt font, 1" margins, and double spacing. Recall you will be graded on process and team cooperation and sharing of roles and tasks, as well. PLEASE be respectful of materials and equipment provided, do not mark on anything except for scratch paper provided, thank you.

Problem:

Your team has been hired by a hog farm to construct 8 concrete pads. Each concrete pad will measure 12 feet by 12 feet and will be 4 inches thick. These pads will be used to secure grain bins used in a hog production operation and will weigh 3500 pounds when full. Each bin will be supported by 4 legs with an 8" x 8" plate on the bottom of each leg. You will begin framing the foundation on Monday and pour all 6 slabs on Wednesday. The grain bin manufacturer recommends that the bins be placed on concrete rated to hold at least 3600 psi.

Sections:

A. (Calculations 10 pts./ Work Shown 10 pts.)

- a. How many cubic yards of concrete would your team need to pour one pad, according to the dimensions listed in the scenario?

i. $12 \text{ ft} \times 12 \text{ ft} \times \frac{1}{3} \text{ ft} = 48 \text{ cubic ft} / 3 = 16 \text{ ft} / 3 = 5.33 \text{ ft} / 3 = 1.78 \text{ cubic yds}$

B. (Calculations 10 pts./ Work Shown 10 pts.)

- a. How many cubic yards of concrete would your team need to pour all 8 pads, assuming that they are all the same size.

i. $1.78 \text{ cubic yds} \times 8 \text{ pads} = 14.24 \text{ cubic yards}$

C. (Calculations 20pts./ Work Shown 20pts.)

- a. Using the price sheets given, how much would the total cost of all 8 pads be. Calculate for both Concrete A and B. Which one is most cost efficient?

i. a) $14.24 \text{ cubic yd} \times \$ 225 = \$ 3,204 / 15 \text{ years} = \$ 213.60$
b) $14.24 \text{ cubic yd} \times \$ 370 = \$ 5,268.80 / 25 \text{ years} = \$ 210.75$
***Concrete B is the most cost efficient.**

D. (Calculations 15pts./ Work Shown 15pts.)

- a. Calculate wages to be paid to your team (assuming that there are 4 members on your team) for labor when the hourly cost is \$35.00 per person. You all spend 8 hours preparing the area for the cement pads and laying the concrete.

i. $4 \text{ members} \times \$ 40.00 \text{ per hour per person} \times 8 \text{ hours} = \$ 1,280.00$

E. (Calculations 15pts./ Work Shown 15pts.)

- a. Calculate the overall cost to charge the hog farm for laying the 8 pads of concrete and for the labor. Be sure to use the most cost efficient concrete to find the overall cost.

i. $\$ 5,268.80 + \$ 1,120.00 = \$ 6,388.80$

*****SHOW ALL WORK FOR CREDIT*****

Concrete A Price List

This concrete should withstand at least 15 years

4 Bag Mix (2000psi).....	\$205.00 per cubic yard
5 Bag Mix (2500psi).....	\$210.00 per cubic yard
6 Bag Mix (3000psi).....	\$215.00 per cubic yard
7 Bag Mix (3500psi).....	\$220.00 per cubic yard
8 Bag Mix (4000psi).....	\$225.00 per cubic yard
9 Bag Mix (4500psi).....	\$230.00 per cubic yard
10 Bag Mix (4500psi).....	\$235.00 per cubic yard

Concrete B Price List

This concrete should withstand at least 25 years.

4 Bag Mix (2000psi).....	\$330.00 per cubic yard
5 Bag Mix (2500psi).....	\$340.00 per cubic yard
6 Bag Mix (3000psi).....	\$350.00 per cubic yard
7 Bag Mix (3500psi).....	\$360.00 per cubic yard
8 Bag Mix (4000psi).....	\$370.00 per cubic yard
9 Bag Mix (4500psi).....	\$380.00 per cubic yard
10 Bag Mix (4500psi).....	\$390.00 per cubic yard