

**Iowa FFA Agricultural Mechanics Career Development Event
2008**

State of Iowa
DEPARTMENT OF EDUCATION
Career Education Division
Grimes State Office Building
Des Moines, IA 50319

CONTESTANT NAMES _____

CONTESTANT SCHOOL _____

Plastic Piping
Team Problem Solving
(50 minutes)

Problem Statement: Your school has decided to start a research garden where you can grow specialty crops used for energy production. In order to maintain crop health during the dry summer period you wish to include an irrigation system. Refer to the diagram on the back of this page.

There are 7 areas (shown in crosshatch) that will be used to grow specialty crops. Each will have an irrigation tube installed down the center with individual irrigation emitters. The emitters should be placed 5 ft apart in the growing areas and have an output of 0.35 gal/min. Your plants need 1 inch of water per day and you have chosen to use 1 inch plastic PVC pipe for all irrigation lines. The emitters have a female one-half inch NPT pipe connection. The pump can connect directly to a single 1 inch plastic PVC fitting. Note: there are 231 in³ in a gallon of water.

You will need to determine the following before you can start building the irrigation system:

- a. How much irrigation water is required per day (in gallons)? _____
- b. How many irrigation emitters will be required? _____
- c. How long should the irrigation system be turned on each day (in hours)? _____
- d. On the following page, specify the list of materials needed to complete the project and construct an example PVC pipe connection.

Evaluation Score Sheet

<u>Items</u>	<u>Points</u>	
	<u>Possible</u>	<u>Earned</u>
1. Question A Answer	20	_____
2. Question B Answer	15	_____
3. Question C Answer	20	_____
4. Materials List	40	_____
5. Fixture Construction	50	_____
6. Attitude and Use of Materials	5	_____
..... TEAM TOTAL	150	_____
INDIVIDUAL TOTAL (Team Total ÷ 3)	50	_____

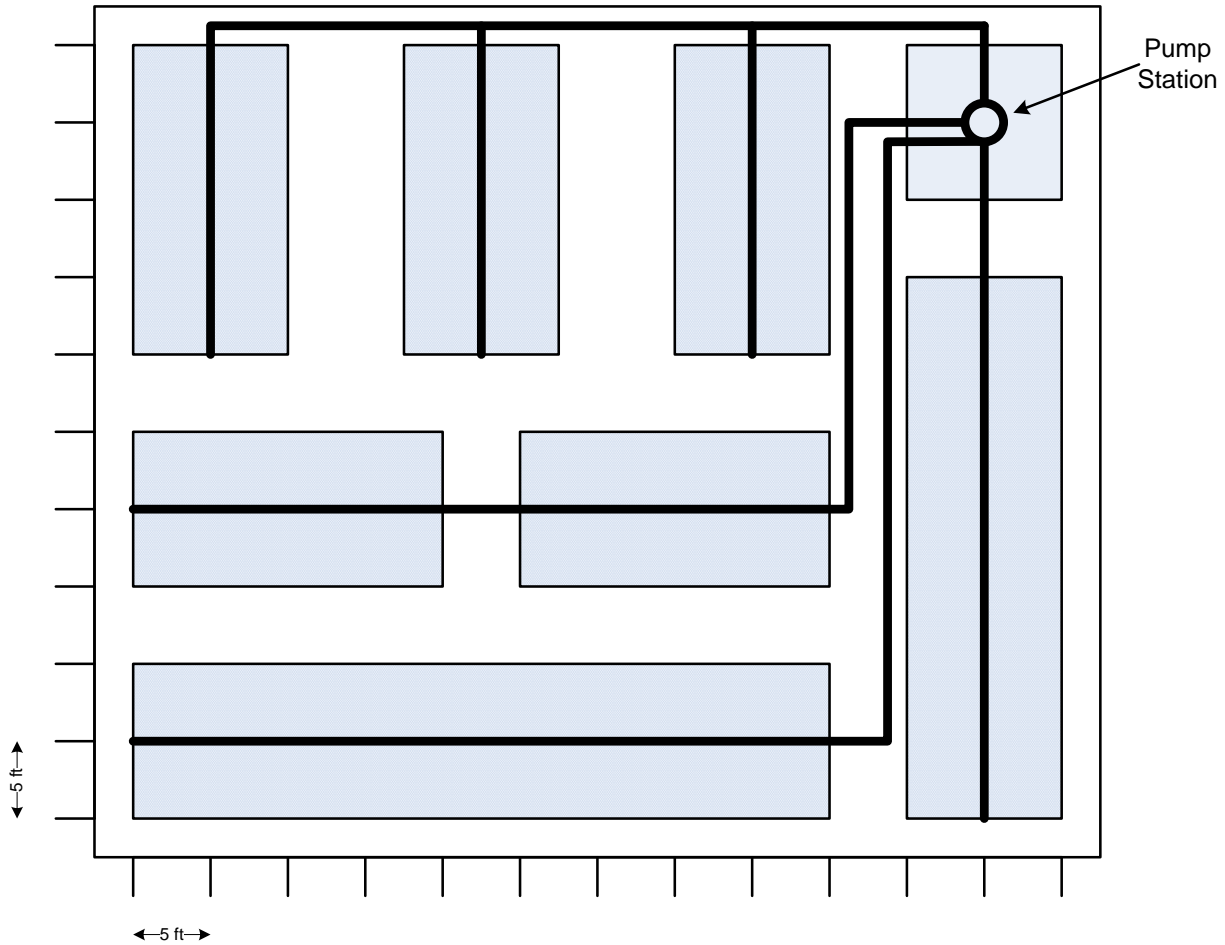
Iowa FFA Agricultural Mechanics Career Development Event
2008

State of Iowa
DEPARTMENT OF EDUCATION
Career Education Division
Grimes State Office Building
Des Moines, IA 50319

CONTESTANT NAMES _____

CONTESTANT SCHOOL _____

Irrigation System Layout



**Iowa FFA Agricultural Mechanics Career Development Event
2008**

State of Iowa
DEPARTMENT OF EDUCATION
Career Education Division
Grimes State Office Building
Des Moines, IA 50319

CONTESTANT NAMES _____

CONTESTANT SCHOOL _____

1. Length (feet) of PVC plastic pipe needed (15)
2. Number of T-fittings (5)
3. Number of L-fittings (5)
4. Number of female NPT to PVC pipe connectors..... (5)
5. Number of male NPT to PVC pipe connectors (5)
6. Number of two-gang plastic outlet/switch boxes (5)

Example Construction Technique

You will be constructing part of the water supply system for the irrigation system. Your task is to assemble the PVC piping as described in the drawing below, assuring that the entire assembly is flat and does not leak under pressure. Use safe work habits.

