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| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **Leadership & Supervised Agriculture Experience** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 1.00 | 9% | C2 | Understand leadership opportunities in agricultural mechanics. |
| **OBJECTIVE:** | 1.01 | 4% | C2 | Understand organizations available for students in agricultural mechanics. |
| Sources of Information:  • Official FFA Student Handbook. Print.  • "Career Development Events (CDE)." National FFA Organization. National FFA Organization, 2013. Web. 25 Apr. 2013. https://www.ffa.org/Pages/default.aspx . | | | | |

**Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content**.

National FFA Organization

A. FFA is a federally chartered organization for students interested in agriculture. The levels of the FFA in North Carolina are:

1. Local chapter.

2. Federation

3. Region.

4. North Carolina FFA Association.

5. National FFA Organization.

B. Parts of a Total Agriculture Program

1. Classroom and laboratory instruction.

2. Supervised Agricultural Experience.

3. FFA.

C. FFA Traditions and Ceremonies

1. FFA Mission Statement- FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success.

2. FFA Motto- Learning to Do, Doing to Learn, Earning to Live, Living to Serve.

3. FFA Colors-national blue and corn gold.

4. FFA Official dress- white collared shirt, FFA jacket (zipped up), black pants or skirt, black shoes, FFA tie or scarf.

5. FFA Opening and Closing Ceremony- ritual that emphasizes the beliefs of the FFA and explains the meanings of certain emblems.

D. FFA Leadership Opportunities

1. Program of Activities- helps in setting goals and developing plans and steps to reach those goals.

2. Career Development Events- competitive events designed to build career skills of FFA members.

1. Speaking Events - develop communication skills.
2. Parliamentary Procedure - learn how to participate in business meetings.
3. Prepared Public Speaking - develop and deliver a speech on an agricultural topic .
4. Skill Events- develop knowledge and build communications skills.
5. Livestock Evaluation- evaluates livestock for market and breeding purposes based on the physical characteristics of the animal.
6. Poultry Evaluation- evaluates the student’s knowledge of the production,

processing and marketing of poultry and their products.

1. Agricultural Mechanics – develops knowledge and skills by working as a team member to identify equipment and solve agricultural mechanics problems.

3. Proficiency Awards- entrepreneurship or placement individual awards growing

out of a student’s SAE program.

4. Banquets, conventions, conferences, social events, community service, serving on a committee are all ways to develop leadership through the FFA.

E. FFA Emblem

1. Cross section of the ear of corn symbolizes common agricultural interest.

2. Eagle symbolizes the national scope of the FFA.

3. Owl symbolizes knowledge and wisdom.

4. Plow symbolizes labor and tillage of the soil.

5. Rising sun symbolizes agricultural opportunity and progress.

6. Agriculture Education and FFA symbolizes the combination of learning and

leadership necessary for progress in agriculture.

F. Officers and Symbols

1. President- sits beside the rising sun and presides over meetings.

2. Vice President- sits beside the plow and calls the roll of officers, coordinates

committee work and assumes presidential duties in the absence of the president.

3. Secretary- sits beside the ear of corn and keeps accurate minutes.

4. Treasurer- sits beside the emblem of Washington and keeps financial records.

5. Reporter- sits beside the American flag and informs and reports events.

6. Sentinel- welcomes members and guests and assists the president in

maintaining order.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **Leadership & Supervised Agriculture Experience** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 1.00 | 9% | C2 | Understand leadership opportunities in agricultural mechanics. |
| **OBJECTIVE:** | 1.01 | 4% | C2 | Understand organizations available for students in agricultural mechanics. |
| Activity Contributors: • Ms. Christy Thornton- Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 1.01**

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| --- | --- |
| **Activity Number** | **Activity** |
| 1.01.01 | **Mind Binders**- Students create cards to help memorize vocabulary from this objective. This activity can be repeated with any objective throughout the course. |
| 1.01.02 | **FFA Emblem**- Students use their notes from Objective 1.01 to fill label and describe the meaning of the parts of the FFA emblem. |
| 1.01.03 | **FFA Match Game**- Students match FFA items to further illustrate the meaning behind various FFA items. |

Activity 1.01.01

**Mind Binders**

1. Take a 3x5” note card and cut it into 4 equal pieces.

|  |  |
| --- | --- |
|  |  |
|  |  |

2. Punch a hole in the upper left hand corner of each card. Give each student a book ring.

O

3. Have students write, draw or place a picture on the front side of the card and put pertinent information on the back side of the card.

FACT

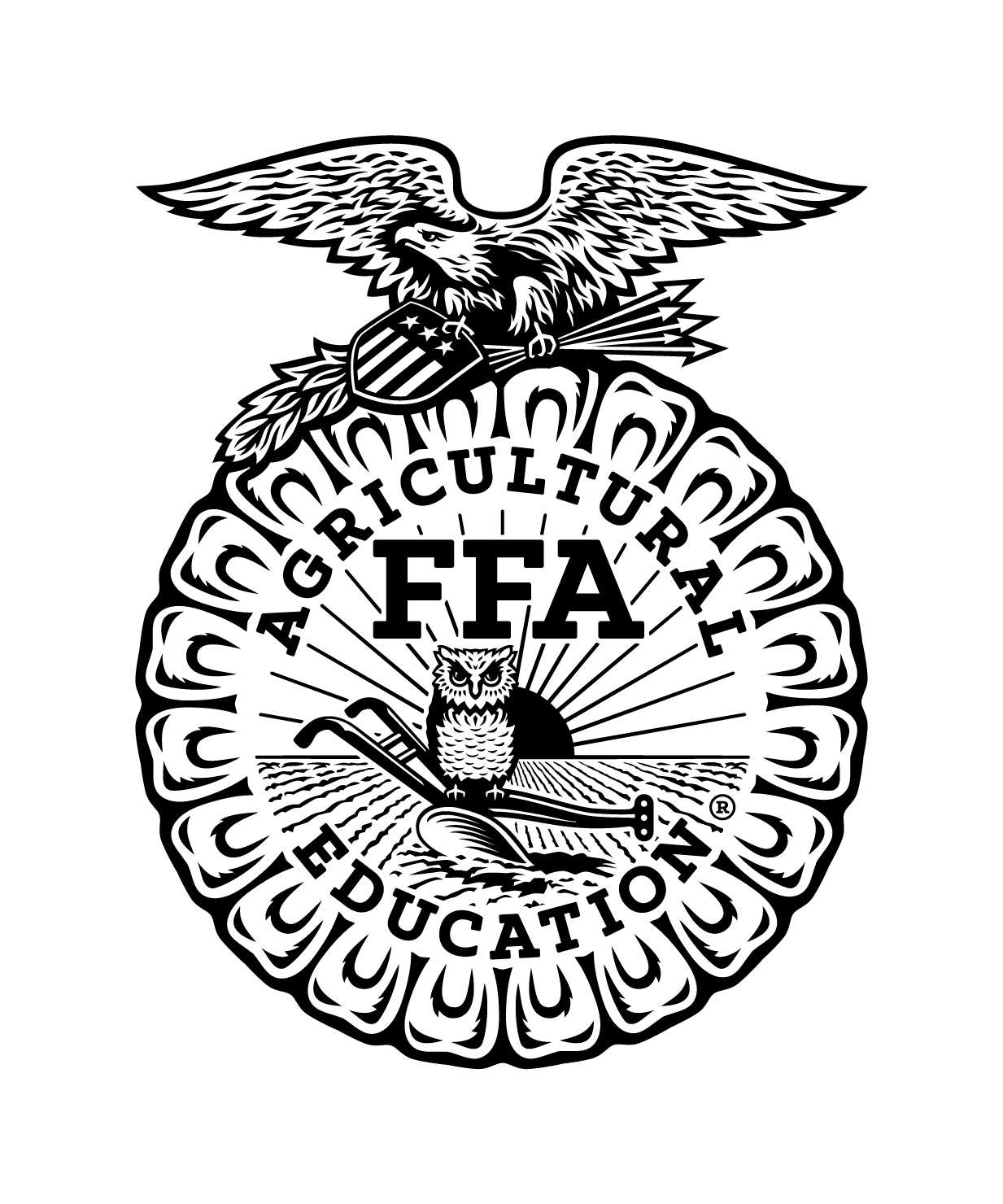
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|  | |  | | --- | | Categories, Description or Example | |

Use this activity with any or all objectives.

Activity 1.01.02

**FFA Emblem**

Student Instructions: Draw a line from each part of the FFA emblem and explain the meaning for each part.



Activity 1.01.03

**FFA Match Game**

Instructions: On 3x5” paper or index cards list the following word(s) and one card for each phrase. Divide students into groups of 3-4. Make enough sets for each group. Color code each set with colored note cards, or a marker or dot.

* FFA Mission Statement
* FFA Motto
* FFA Colors
* FFA Official dress
* Cross section of the ear of corn symbolizes
* Eagle symbolizes
* Owl symbolizes
* Plow symbolizes
* Rising sun symbolizes
* Agriculture Education and FFA symbolizes
* President
* Vice President
* Secretary
* Treasurer
* Reporter
* Sentinel
* FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success
* Learning to Do, Doing to Learn, Earning to Live, Living to Serve
* national blue and corn gold
* White collared shirt, FFA jacket (zipped up), black pants or skirt, black shoes, FFA tie or scarf
* common agricultural interest
* national scope of the FFA
* knowledge and wisdom
* labor and tillage of the soil labor and tillage of the soil
* agricultural opportunity and progress
* combination of learning and leadership necessary for progress in agriculture
* rising sun-presides over meetings
* plow-calls the roll of officers, coordinates committee work and assumes presidential duties in the absence of the president
* ear of corn-keep accurate minutes
* emblem of Washington-keep financial records
* American flag-informs and reports events
* welcomes members and guests and assists the president in maintaining order

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **Leadership & Supervised Agriculture Experience** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 1.00 | 9% | C2 | Understand leadership opportunities in agricultural mechanics. |
| **OBJECTIVE:** | 1.02 | 5% | C2 | Understand parliamentary procedure abilities and public speaking skills. |
| Sources of Information:  • Official FFA Student Handbook. Print.  • Henry, Robert III M., Daniel N. Honemann, and Thomas J. Balch. Robert's Rules of Order Newly Revised. Cambridge, MA: Da Capo Press, 2011. Print. | | | | |

***Note to teacher: If Agriscience Applications was taught earlier in the course sequence, Activity 1.02.01 may be used as a Pre-test to determine the amount of review needed. Another option is to use it as a worksheet to cover parliamentary procedure basics with students.***

Parliamentary Procedure

A. Definition of Parliamentary Procedure- using well-defined rules to conduct business through a formal, organized approach. (Roberts Rules of Order).

1. Robert’s Rules of Order – Book of parliamentary authority by Henry M. Robert

that serves as the basis for parliamentary law.

2. By-laws – Written document that gives the mission of the group (organization)

providing procedures that govern its operation and forming the framework where

parliamentary procedure is used.

B. Parliamentary Procedure Vocabulary

1. “Floor, Body, House or Assembly” – Terms used to describe those assembled as

voting delegates in a business meeting

2. Agenda - A list of items prepared prior to the meeting date to be discussed or

done during the meeting.

1. Closely related to the Order of Business but not always the same.
2. May include details within the Order of Business.

3. Order of Business – Sequence followed in conducting a business meeting.

1. Vary from one organization to another according to need
2. Sample order of business followed by FFA Chapters:

1. Call to Order

2. Reading/approval of minutes of minutes of previous meeting

3. Treasurer Report

4. Report from Standing Committees (Permanent Committees) responsible for the Chapter Program of Activities

5. Old (Unfinished) business

6. New Business

7. Adjournment

4. “The Chair” – official term for the person presiding.

1. If the President is presiding, the proper address is Mr./Madam President
2. If the President is not presiding, the person should be referred to as Mr./Madam Chairman or Chairperson
3. The person presiding whether it is the President or some other person usually refers to herself or himself as “The Chair”.

5. Quorum – The number or percentage of members established in the bylaws that

must be present at a business meeting to legally transact business.

1. Keeps a small group from enacting rules and motions that do not represent the desires of the group.
2. If not established in the bylaws as a lower percentage or number a quorum is usually a majority of the membership.

6. Parliamentary Abilities – Motions that may be used to dispose of main motions or

help in the transaction of business.

7. Majority vote – more than half of those voting vote on the same side. (51 of 100)

8. Two-thirds vote – vote required for motions that take away privileges such as the

right to discuss; make nominations; motions that do things normally against the

rules or change the rules (by-laws). An example of a 2/3 Vote for 30 people voting would be 20 voting in favor for the motion to pass.

C. The use of parliamentary procedure ensures that business meetings are conducted fairly and quickly. Objectives of using parliamentary procedure are:

1. Extend courtesy to everyone.

1. Only one member may speak at a time, and
2. Members may speak only after being recognized by “The Chair” except in

emergency situations or to enforce parliamentary law.

2. Focus on one item at a time.

1. Only one motion on the floor at one time
2. Each motion must be dealt with according to order of rank in precedence

3. Observe the rule of the majority

1. Over half the members entitled to vote agree that the group will take actions before action is taken.
2. Sometimes 2/3 majority is required for action

4. Protect the rights of the minority

1. Minority represents less than half or sometimes less than 1/3 of voting members who do not agree actions should be taken
2. Minority can always make motions
3. Minority can always voice their opinion through discussion
4. Minority can always vote according to their conviction.

D. Rules for the presiding officer (“the Chair”)

1. Keep the meeting moving in a smooth fashion

2. Must be fair and impartial without infringing on the rights of members

3. Leaves “The Chair” and relinquish chairman’s duties to discuss or present a point

of view.

E. Proper Gavel Use – The gavel represents or is the symbol of authority for the position of the presiding officer.

1. Just as the presiding officer should not bang or abuse the gavel, he/she should

never abuse the power of their position.

2. Firm taps of the gavel are used to signal members:

1. One tap means to sit down, announce the completion of a vote; or signal adjournment.
2. Two taps means to call the meeting to order.
3. Three taps means for all members to stand in unison.
4. A series of taps may be used on occasion to help restore order.

F. Discussion allows members to discuss pros and cons of a debatable motion.

1. Discussion is not just “I agree with the motion” or “I disagree with the motion,” but

why does one agree or disagree with the motion.

2. Discussion should be directed by “the Chair” so that:

1. The member who made the motion has first opportunity to discuss.
2. Members who have not spoken yet are given priority to discuss so no person should discuss a motion twice as long as others who have not spoken are seeking recognition to discuss the motion.
3. If possible, “The Chair” should alternate discussion between those “for” and those “against” the motion.

G. Four Methods of Voting

1. Voice vote – “All those in favor say ‘aye’, all those opposed say ‘no’”.

2. Visual vote – taken by either having members stand or raise their hands; each

vote may or may not counted.

3. Roll call – each member’s name is called and they are asked for their vote

4. Ballot – written vote that provides for secrecy

H. Steps in Making and Disposing (Handling) motions:

1. Member stands and addresses the presiding officer, “Mr./Madam President, etc.” and waits for recognition. (Division, Point of Order, Appeal do not require recognition so steps 1 and 2 are amended to the situation)

2. Presiding officer assigns the floor by giving recognition to speak.

3. Member states his/her motion by saying “I move…”

4. Another member seconds the motion ensuring that more than one member wants an item of business before the meeting. (Some motions such as Division and Point of Order do not require a second so this step is skipped).

5. The chair states the question on the motion, by saying “The motion has been made and seconded to and announces whether the motion is debatable, amendable and the vote required.”

1. Neither making the motion nor seconding the motion can put it before the assembly or on the floor.
2. Only the chair can do that. (Robert’s Rules of Order)

6. “The Chair” calls for discussion if the motion is debatable by saying some form of “Is there any discussion?”

7. “The Chair” restates the motion and calls for the vote.

1. Says something like “The motion before us is to have a banquet.”
2. All in favor of the motion say “aye”, all opposed say “no”.

8. The chair announces the result of the vote by telling four things:

1. Result of voting, “the “ayes” have it” or “the “no’s” have it”
2. Declare if the motion is adopted or lost
3. Tells the effect of the vote or orders the execution of the vote
4. Announce the next item to be considered or says that the floor is open for

further business

**Parliamentary Procedure Abilities**

1. Main Motion – Used to present a new item of business for consideration. Main motion must be made by a person who has received proper recognition and the maker states the motion by preceding it with “I move..”.

1. Only one can be on the floor or before the group at the same time.
2. Must be seconded.
3. Can be debated.
4. Can be amended.
5. Requires a majority vote for adoption.
6. Can be reconsidered.

2. Amendment – Used to change a motion by striking out, adding or substituting words. Motion to amend must be made by a person who has received proper recognition and the maker states the motion by preceding it with “I move to amend the motion by...”

1. Only one amendment can be considered at a time..
2. Must be seconded.
3. Can be debated.
4. Can be amended.
5. Requires a majority vote for adoption.
6. Can be reconsidered.

3. Division of the House (Assembly) - Used to get a re-vote by asking for a “rising” vote on a “voice” vote or “hand” vote. The member asking for a “Division” does not have to wait for recognition and may simply say “Division” or “I call for a division of the house” or “I call for a division” when “the chair” is announcing the result of the vote.

1. Member seeking a division does not have to stand
2. Does not have to be seconded.
3. Cannot be debated.
4. Cannot be amended.
5. It is a demand and must be followed if called for.
6. It cannot be reconsidered.

4. Refer to a Committee – Used to place the motion into the hands of a small group. Motion to refer must be made by a person who has received proper recognition and the maker states the motion by preceding it with “I move we refer this motion to...”

1. The maker of the motion should include the number on the committee (usually odd number like 3, 5 or 7), how they are to be appointed, their powers or duties and when they are to report back or act. Powers to be identified include:
2. Power to act for the group
3. Power to investigate and report back
4. Power to investigate and make recommendations.
5. Must be seconded.
6. Can be debated.
7. Can be amended.
8. Requires a majority vote.
9. Can be reconsidered.

5. Previous Question - the formal motion to stop discussion. (This is not to be confused with the person who shows their desire to vote by saying “question”). Motion to stop discussion must be made by a person who has received proper recognition and the maker states the motion by preceding it with “I move the previous question” or “I move to stop (close) debate”

* 1. This motion should be reserved until much discussion has been made and no new ideas are being presented.
  2. Must be seconded.
  3. Cannot be debated.
  4. Cannot be amended.
  5. Requires a 2/3 vote for adoption and if passed requires an immediate vote on the pending question without any further discussion.
  6. Can be reconsidered when the vote was affirmative before any vote is taken under it.

6. Point of Order - Used to correct a parliamentary mistake or enforce rules. The member rising to a “point of order” does not have to wait for recognition and will say “I rise to point of order” or “point of order.”

1. Member should stand and may interrupt another speaker.
2. Does not have to be seconded.
3. Cannot be debated.
4. Cannot be amended.
5. It is a demand and must be ruled upon by the chair.
6. It cannot be reconsidered.

7. Appeal - Used to ensure that the majority of the group agrees with a ruling of “The Chair”. It is often used when one does not agree with the ruling on a point of order. The member “Appealing the decision of ‘The Chair’ does not have to wait for recognition and will say “I appeal the decision of the chair”.

1. Member should stand and may interrupt another speaker.
2. Must be seconded.
3. Can be debated if the ruling pertained to a debatable motion.
4. Appeals applied to decorum in speaking or broken laws of parliamentary procedure are not debatable.
5. Cannot be amended.
6. A majority or tie vote sustains the decision of the chair
7. Can be reconsidered.

8. Suspend the Rules - Used to temporarily suspend the rules of an organization. The motion “to suspend the rules” must be made by a person who has received proper recognition and the maker states the motion by saying “I move to suspend the rules of.”

1. Can be applied to any rule of the assembly except by-laws.
2. Must be seconded.
3. Cannot be debated.
4. Cannot be amended.
5. Requires a 2/3 vote to pass.
6. Cannot be reconsidered.

9. Adjourn – Use to close the meeting. The motion “to adjourn” must be made by a person who has received proper recognition and the maker states the motion by saying “I move to adjourn”.

1. The motion takes precedence over all other motions except “fix the time to

which to adjourn”.

1. Must be seconded.
2. Cannot be debated.
3. Cannot be amended.
4. Requires a majority vote.
5. Cannot be reconsidered.

10. Relinquishing the duties of “The Chair”. The presiding officer may relinquish his/her duties to participate in discussion but should only rarely do so.

1. “The Chair” that wishes to participate in debate should call upon the ranking officer who has not debated or who does not wish to debate to assume his/her duties until the pending item is disposed of.
2. “The Chair” may also relinquish their duties to attend to an urgent matter that require their attention outside the meeting but this should be used only in remote circumstances.
3. Upon resuming the duties of “The Chair”, the presiding officer will be informed of action taken by the person who assumed the chair in their absence.

I. Prepared Public Speaking

1. Types of Speeches

1. Informative - provide information.
2. Persuasive - speeches given to change or sway the mind of the audience to align with the message of the speaker.
3. Extemporaneous or Impromptu - speeches are given with little or no preparation.

2. Three Basic Parts of a Speech.

1. Introduction- grabs the attention of your audience.
2. Body- begins with the main points and arranges them in logical order.
3. Conclusion- summarizes the main points of your speech.
   * + 1. Preparing & Writing a Speech
4. Speech Preparation
   1. Purpose- speeches can be written based on a specific reason or

purpose such as explaining a new technology to a group.

* 1. Audience- speech writers should take into consideration “who” they

are going to present to. For example a speech on retirement options would not be as interesting to a group of high school students.

* 1. Occasion- speeches can also presented for special events such as

banquets, leadership conferences, etc.

1. Topic Selection - once the speech writer knows the purpose, audience

and/or occasion for the speech they can then select an appropriate topic.

* + - 1. Choose a topic that interests you.
      2. Choose a topic you are knowledgeable about.
      3. Choose a topic of interest to you audience.
      4. Brainstorm with a list of topics and write down key words.

1. Gather information from a variety of materials, books, internet, personal

interviews, etc.

1. Write down your ideas including, name of source, web address, page

number and author.

1. Create an outline to help you organize your ideas.
2. Write the speech the way you talk, but do not use slang terms.
3. Be enthusiastic, smile, use gestures, have good eye contact, and be

sincere when presenting your speech.

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| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **Leadership & Supervised Agriculture Experience** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 1.00 | 9% | C2 | Understand leadership opportunities in agricultural mechanics. |
| **OBJECTIVE:** | 1.02 | 5% | C2 | Understand parliamentary procedure abilities and public speaking skills. |
| Activity Contributors:  • Ms. Christy Thornton- Agriculture Education Instructor Emeritus  • Ms. Laura Allen- Agriculture Education Instructor, South Rowan High School  • Horace Johnson-Central Region Agricultural Education Coordinator | | | | |

**Suggested Activities 1.02**

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| --- | --- |
| **Activity Number** | **Activity** |
| 1.02.01 | **Parliamentary Procedure Pretest (Worksheet)** - Students take this prior to Objective 1.02 to determine how much review needs to take place. |
| 1.02.02 | **FFA Parliamentary Procedure YouTube Video** - Students watch the FFA Parliamentary Procedure video to illustrate how abilities are presented in a business meeting. YouTube video link: http://www.youtube.com/watch?v=B9UtVyl3jOU |
| 1.02.03 | **PARLI-O Bingo Game** - Students play bingo by answering questions about parliamentary procedure. |
| 1.02.04 | **Parliamentary Procedure Help Sheet** - Students fill in the chart using notes or the FFA Student Manual. |
| 1.02.05 | **Parliamentary Procedure Mock Business Meeting Practicum** - The teacher will divide the class into groups of 6-7 students. Students select an FFA officer position. The group then works to create a script of a mock business meeting using the parliamentary law basics and parliamentary procedure abilities. This activity can count as a practicum test grade or daily grades |
| 1.02.06 | **Prepared Public Speaking Assignment** - Students research, write and deliver a 4-6 minute speech on an agriculture topic. The teacher should keep a list of topics and not allow any students to have the same topic. Students can write speeches using Google documents so the teacher can proof/review rough drafts prior to final submission. Use the NCFFA Prepared Public Speaking Score Sheet to grade speech presentations. This rubric can count 50% of the student’s grade and the other 50% can be manuscript content.  AA21 |

**Activity 1.02.01 Parliamentary Procedure Pre-Test (Worksheet)**

Select the answer that BEST completes the statement and write that letter in the blank to the left.

\_\_\_\_\_\_\_\_1. Which motion requires a two-thirds vote?

A. Adjourn

B. Point of Order

C. Previous Question

D. Amend

\_\_\_\_\_\_\_\_2. Which motion is debatable?

A. Adjourn

B. Point of Order

C. Previous Question

D. Amendment

\_\_\_\_\_\_\_\_3. Which motion does not require a second?

A. Adjourn

B. Point of Order

C. Refer to a Committee

D. Main Motion

\_\_\_\_\_\_\_\_ 4. Which motion requires no vote?

A. Point of Order

B. Suspend the Rules

C. Previous Question

D. Adjourn

\_\_\_\_\_\_\_\_ 5. If 21 members vote on an issue that requires a 2/3rds vote, how many votes are needed for passage?

A. 11

B. 14

C. 21

D. 5

\_\_\_\_\_\_\_\_ 6. Which motion requires a majority vote?

A. Point of Order

B. Amendment

C. Previous Question

D. Suspend the Rules

\_\_\_\_\_\_\_\_ 7. Which motion is not debatable?

A. Adjourn

B. Amend

C. Refer to a Committee

D. Main Motion

\_\_\_\_\_\_\_\_8. Which motion does not require a majority vote?

A. Adjourn

B. Main Motion

C. Amend

D. Previous Question

\_\_\_\_\_\_\_\_ 9. Which motion allows the group to act in a way that is against established rules of parliamentary law?

A. Main Motion

B. Amendment

C. Suspend the Rules

D. Point of Order

\_\_\_\_\_\_\_\_10. Which is TRUE as pertaining to a tie vote?

A. Cannot be broken in any way

B. May be broken by a vote from the chair

C. May be broken with an automatic revote

D. May be broken with a coin toss from the advisor

\_\_\_\_\_\_\_\_ 11. Which places a motion into the hands of a small group?

A. Amendment

B. Adjourn

C. Refer to a Committee

D. Suspend the Rules

\_\_\_\_\_\_\_\_12. Which motion does the president decide without a vote from members?

A. Main motion

B. Point of order

C. Amend

D. Suspend the Rules

\_\_\_\_\_\_\_\_13. Which motion is not debatable?

A. Refer to a committee

B. Main

C. Amendment

D. Previous question

\_\_\_\_\_\_\_\_14. One tap of the gavel is used to:

A. Start the meeting.

B. Call for order in the meeting.

C. Have all members sit.

D. Have all members stand.

\_\_\_\_\_\_\_\_15. Two taps of the gavel is used to:

A. Start the meeting.

B. Call for order in the meeting.

C. Have all members sit.

D. Have all members stand.

\_\_\_\_\_\_\_\_16. Three taps of the gavel is used to:

A. Start the meeting.

B. Call for order in the meeting.

C. Have all members sit.

D. Have all members stand.

\_\_\_\_\_\_\_ 17. A series of taps of the gavel mean

A. Start the meeting.

B. Call for order in the meeting.

C. Have all members sit.

D. Have all members stand.

\_\_\_\_\_\_\_18. If 30 members are in the meeting, how many have to vote “Aye” for the main motion to pass?

A. 15

B. 16

C. 20

D. 30

\_\_\_\_\_\_\_ 19. Why is only one motion considered at a time?

A. Encourages business to be conducted in an orderly fashion

B. Prevents members from making motions

C. Allows the chairman to make all the decisions

D. Keeps members from discussing motions

\_\_\_\_\_\_\_\_20. Which refers to the number of members required to legally conduct a business meeting?

A. Agenda

B. Minority

C. Minutes

D. Quorum

21. What are the four methods of voting? By methods I mean, what are the ways a member can find vote on the motion. (Please answer completely!)

22. If a member wishes to make a main motion, how do they do so?

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

23. What should take place once a main motion has been made before it should be considered by the group? Why?

24. What is the reason some motions require a 2/3 vote to pass while others only require a majority vote?

25. Please match the motion to its definition by placing the letter in the blank to the left.

\_\_\_\_\_\_\_\_\_Main motion A. used to correct a parliamentary mistake

\_\_\_\_\_\_\_\_\_Amend B. used to end the meeting

\_\_\_\_\_\_\_\_\_Point of order C. used to end debate

\_\_\_\_\_\_\_\_\_Previous question D. used to introduce a new item of business

\_\_\_\_\_\_\_\_\_Adjourn E. used to change a main motion

**Activity 1.02.01 - Parliamentary Procedure Worksheet KEY**

1. C

2. D

3. B

4. A

5. B

6. B

7. A

8. D

9. C

10. B

11. C

12. B

13. D

14. C

15. B

16. D

17. B

18. B

19. A

20. D

21. Four Methods of voting are: a. Voice, b. Visual, c. Roll call d. Secret Ballot

22. Three things a member should do to make a main motion:

a. Member stands and addresses the presiding officer by Mr./Madam President or Chairman/chairperson and awaits recognition

b. The Chair assigns the floor by recognizing the person to speak

c. The member states his/her motion by saying “I move”

23. What should take place once a main motion has been made before it should be considered by the group? Why?

a. It should be seconded to show that another member agrees the motion should take up the time of the group

24. What is the reason some motions require a 2/3 vote to pass while others only require a majority vote?

a. Motions that take away the rights of the individual such as the right to debate, make nominations or motions that might change rules that have been set up to guide the meeting or that temporarily set aside rules all take away from member’s rights or established protocol

25. Matching

**a.** Main: D, **b.** Amend E, **c.** Point of Order: A, **d.** Previous Questions C, **e.** Adjourn: B

**Activity 1.02.03**

PARLI-O (BINGO) words

Write the following word or phrases on the board or on a transparency. Have students write the words randomly on the PARLI card.

adjourn informative speech

parliamentary procedure one

agenda appeal

introduction gavel

conclusion recess

body call the meeting to order

“I move to…” or “I move that…” Roberts Rules of Order

sit down announce vote

main objective of parliamentary majority

minority quorum refer to a committee

methods of voting adjourn

brainstorming presenting your speech

amend persuasion speech

After they fill in their PARLI cards, the teacher reads the PARLI (BINGO) clues and students put a marker over the box of their answer. The teacher can make markers or use cheerios or M&M’s. The first student to get a row, column or diagonal wins the game.

**Activity 1.02.03**

PARLI-O (BINGO) BOARD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **P** | **A** | **R** | **L** | **I** |
|  |  |  |  |  |
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|  |  |  |  |  |
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|  |  |  |  |  |

**Activity 1.02.03**

PARLI-O (BINGO) Clues

Read the following for Parliamentary Procedure for PARLI-O.

1. To end a meeting.

Answer: adjourn

2. The organized way of conducting a meeting.

Answer: parliamentary procedure

3. A list of what will be discussed at a meeting.

Answer: agenda

4. When giving a speech this grab the attention of your audience.

Answer: introduction

5. Summarizing the main points of your speech.

Answer: conclusion

6. To take a brief break and meet later.

Answer: recess

7. Begins with the main points of your speech and arranges them in logical order.

Answer: body

8. Two taps of the gavel.

Answer: call meeting to order

9. To make a main motion you would say \_\_\_.

Answer: “I move to…” or “I move that…”

10. The book of authority used to conduct business using a formal, organized approach.

Answer: Roberts Rules of Order

11. One tap of the gavel.

Answer: sit down, announce vote, and adjourn

12. More than ½ of the group that controls the most votes.

Answer: majority

13. 2/3 of the total membership.

Answer: quorum

14. Less than half of the group voting.

Answer: minority

15. To place a motion to a committee.

Answer: refer to a committee

16. Voice vote, show of hands, standing, and ballot.

Answer: methods of voting

17. Focus on one item at a time which helps prevent confusion.

Answer: main objective of parliamentary law

18. To think of a list of topics and write down key words is known as \_\_\_\_.

Answer: brainstorming

19. Be enthusiastic, smile, use gestures, have good eye contact and be sincere when:

Answer: presenting your speech

20. To change a motion.

Answer: amend

21. A speech that gives the audience information.

Answer: informative speech

22. To change or persuade the mind of the audience to align with the message of the speaker.

Answer: persuasion speech

23. Only \_\_\_ motion(s) can be on the floor or before the group at the same time.

Answer: one

24. To change the decision of the chair.

Answer: appeal

25. The symbol of authority is the \_\_\_\_.

Answer: gavel

**Activity 1.02.04**

**PARLIAMENTARY PROCEDURE HELP SHEET**

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_

Directions

• Fill in the chart using your notes, the internet, or the FFA Student Manual to determine what each ability requires during a parliamentary procedure meeting.

• Using a highlighter color in each box that corresponds to the correct answer.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ability** | **Debate** | **Amend** | **Vote** | **Second** |
| Main Motion |  |  |  |  |
| Previous Question |  |  |  |  |
| Amendment |  |  |  |  |
| Division of House |  |  |  |  |
| Refer to a Committee |  |  |  |  |
| Point of Order |  |  |  |  |
| Adjourn |  |  |  |  |

**Activity 1.02.05**

**Parliamentary Procedure Mock Business Meeting Practicum**

Objectives:

• Discuss parliamentary procedure guidelines.

• Demonstrate knowledge of parliamentary procedure abilities.

• Collaborate to develop a script that outlines a business meeting.

Instructions:

1. The teacher will divide the class into groups of 6-7 students. Every student in the group will select an “officer” position. Please remember the president will be presiding over the meeting and help lead your group through a mock parliamentary procedure business meeting. Each group will practice and present the FFA opening and closing ceremony as a part of their business meeting. You do not need to memorize the officer parts!

2. As an “officer team,” you will work to create a flow chart script that includes the following abilities:

– Main Motion.

– Amend.

– Refer to a Committee.

– Point of Order.

– Division of House.

– Previous Question.

– Adjourn.

– The president can use the script during the mock business meeting, but members must participate from memory.

3. Grading Rubric:

– To complete the assignment students must work together to create the script and PRACTICE it prior to the presentation date.

– The student “president” is scored based on their ability to lead the officer team through the meeting following parliamentary procedure rules.

– Each student receives an individual TEST grade based on the following rubric:

1. 25 points for opening and closing ceremony.

2. 25 points for one “primary” motion.

• Main.

• Refer to Committee.

• Amend.

3. 25 points for one “accessory motion.”

• Division of house.

• Point of order.

• Previous question.

4. 25 points for discussion during debate.

**Activity 1.02.06 Prepared Public Speaking Assignment**

Student Instructions:

• Students will research, write and deliver a 4-6 minute speech on an agricultural topic. This assignment will count as a test grade.

• Each student’s manuscripts must be the result of the student’s own efforts.

• Participants must submit one printed copy of their speech before they deliver the speech.

• Speech manuscripts should be double-spaced and typewritten. The body of the speech will have 1” margins and 12 point, Times New Roman font.

• The manuscript should have a bibliography for citing references. The bibliography should follow APA style.

• Facts and data may be obtained from any reputable source.

• Time Limit- Each speech shall be a minimum of four minutes in length and a maximum of six minutes. At the conclusion of your speech, there will be a question/answer session that does not include the 6-minute time frame.

***Today’s Assignment: Create the speech outline.*** On a sheet of notebook paper use the following format to create a speech outline. Use the information below to help guide you on what needs to be included in your outline.

I. Introduction

a. Introduce Story: For this bullet, provide an introduction to your speech such as a story or facts/figures that will lead the audience into your topic.

b. Preview Statement: This is the equivalent of the thesis statement that you write for a regular English paper. For a speech you just put it in a “spoken” format. Ex: “Today I’m going to help you discover the world of forestry by first explaining how timber is harvested, and then we’ll look at … The preview statement overviews the three main topic ideas of your speech.

II. Body (This is the “meat and potatoes” of your speech. In your outline give pieces of information that you would include in each main point.

a. First Point: Ex: How timber is harvested

i. Clear cut

ii. Pulp Wood

iii. Equipment: Track Hoe, Saws, Etc.

b. Second Point

c. Third Point III.

Conclusion

a. Review Statement: This is simply the reverse of your Preview Statement. Ex: Today we looked at the world of forestry by first…

b. Closing Remarks

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **Leadership & Supervised Agriculture Experience** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 1.00 | 9% | C2 | Understand leadership opportunities in agricultural mechanics. |
| **OBJECTIVE:** | 1.03 | 4% | C2 | Understand skills needed for employment and careers in the agricultural mechanics industry. |
| Sources of Information:  • *Agricultural Mechanics: Fundamentals and Applications* – Unit 2 – Career Options in Agriculture Mechanics  • *FFA Student Handbook* – Agricultural Mechanics Industry Careers pp. 75-88 | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Skills, Personal and Educational Qualifications**

A. Skills vary from unskilled to highly skilled depending on the career in agricultural mechanics. A materials handler needs few skills, but an inspector needs many skills to check for quality.

B. Personal interests and qualifications include:

1. Working inside or outside or a combination.

2. Working in a group or alone.

3. Working with people or tools.

4. Working at routine tasks or varying tasks.

5. Physical strength to do the job.

C. Education qualifications vary depending on the careers.

1. High school graduate or less for unskilled entry-level jobs.

2. Technical education for skilled jobs such as technician.

3. Bachelors, masters or doctoral degrees for most professional areas such as engineer because of required licenses, paper work, research and/or teaching.

**Agricultural Mechanics Industry Careers**

1. An agricultural engineer designs tractors and agricultural machines.
2. A forester keeps chainsaws and other forestry equipment running.
3. A builder constructs agricultural buildings, and facilities.
4. An electrician installs wiring, switches, electric motors, and climate controls such as thermostats and humidistats.
5. An agricultural mechanic repairs tractor, truck and other farm equipment engines.
6. A welder uses welding machines to repair broken metal machinery and to construct metal equipment.
7. A hardware store employee displays and sells tools, parts, and materials to repair agricultural machinery and equipment.
8. A soil conservationist constructs terraces and designs plans to prevent erosion.
9. A drainage and irrigation system designer and installer plans and installs those systems for fields, turf, landscape, and golf courses.
10. A lawn equipment service mechanic repairs lawn tractors, mowers and other lawn and turf equipment.

**Agricultural Mechanics Definition and Areas**

A. Definition

1. Mechanics is the branch of physics that deals with motion and the action of forces on bodies.

2. Agricultural mechanics is the selection, operation, maintenance, servicing, selling and use of power units, machinery, equipment, structures, and utilities used in agriculture.

B. Categories of Agricultural Mechanics

1. General Agricultural Mechanics involves using skills and knowledge from all the categories.

2. Agricultural Electrification, Power, and Controls includes installing, servicing, and repairing electrical wiring, controls and power.

3. Agricultural Power Machinery Operation is operating tractors and agricultural equipment.

4. Agricultural Mechanics, Construction and Maintenance includes constructing, maintaining, and repairing agricultural structures, equipment and machinery.

5. Agricultural Structures, Equipment, and Facilities include concrete, carpentry, plumbing, heating, ventilation and air conditioning.

6. Soil and Water Mechanical Practices involve water quality, soil and water conservation practices, irrigation and waste disposal.

7. Other Agricultural Mechanics includes any category not listed above.

**Importance of Agricultural Mechanics**

A. Economic – money

1. Provides jobs.

2. Saves on repair costs.

3. Increases agricultural production efficiency.

B. Environmental – health and comfort

1. Maintains and repairs to prevent accidents.

2. Cleans, heats, and cools air.

3. Provides safe food supply (refrigeration).

C. Outlook is for the agricultural mechanics industry to remain strong because of increase in population, technology, and new home construction requiring more lawn equipment.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **Leadership & Supervised Agriculture Experience** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 1.00 | 9% | C2 | Understand leadership opportunities in agricultural mechanics. |
| **OBJECTIVE:** | 1.03 | 4% | C2 | Understand skills needed for employment and careers in the agricultural mechanics industry. |
| Activity Contributors:  • Ms. Christy Thornton- Agriculture Education Instructor Emeritus  • Kim Sexton- Agriculture Education Instructor- East Davidson High School | | | | |

**Suggested Activities 1.03**

|  |  |
| --- | --- |
| **Activity Number** | **Activity** |
| 1.03.01 | **Career Research Activity & Notes Chart** - Students are assigned a career from the list included under the occupational categories section of Objective 1.03 unpacked content. Each student will then present that career to the class. The class will use the Career Information Table to take notes about the various careers presented to them. |
| 1.03.02 | **ICOSAHEDRON Activity Instructions** - Students create an icosahedron displaying the various careers in the agricultural mechanics industry. The teacher can assign careers from the list under the agricultural mechanics occupational categories and/or use same careers that were assigned in activity 1.03.01. For this activity, the students find or draw images representing the various careers and place them on the individual icosahedron pieces. Then as a class the teacher assembles the icosahedron and hangs it in the classroom. |
| 1.03.03 | **College Foundation of North Carolina “Paws in Jobland**”- Students use the “Paws in Jobland” interactive animation site to explore various careers and complete a simple personality survey to help students decide on a career they might be interested in. Website link: http://www.cfnc.org/index.jsp |
| 1.03.04 | **Career Bulletin Board** - Students help the teacher create a bulletin board that highlights the various careers in the agricultural mechanics industry. The bulletin board can feature a picture of a career on one side of an index card and then the student can “flip up” the index card to reveal the name of that career. The bulletin board can be arranged according to the various occupational categories and/or educational requirements. |

**Activity 2.01.01**

**Career Research Assignment and Notes Chart**

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Instructions: Use the Internet to research the career assigned to you by your teacher. Use this sheet to fill in the information on “your” career.

Career Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Description:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Education/Training: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Job Outlook: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Working Conditions: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Earnings/Salary: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Activity 2.01.01**

**Career Research Assignment and Notes Chart**

Career Notes Chart Student Instructions: Fill in the chart as your classmates present the information on the various agricultural mechanics careers.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Career Title** | **Description** | **Education/**  **Training** | **Job Outlook** | **Working Conditions** | **Earnings** |
|  |  |  |  |  |  |
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**Activity 2.01.02**

**Icosahedron Instructions**

1. The teacher can put students into groups based on each of the occupational categories or create one icosahedron for the entire class.

2. Cut 20 circles out of construction paper.

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3. Fold each circle into equal triangles as shown.

4. Using the magazines, newspapers, the Internet and other sources, cut 1-2 pictures or items to represent occupations in the agricultural mechanics industry. Write the educational requirements, working conditions and/or description for each occupation.

5. Assemble the icosahedrons as follows:

a. Use 5 circle to create the “top” by attaching the pieces by the flaps- the finished element will resemble a beanie hat.

b. Use 5 circles to create the “bottom.”

c. Use 10 circle to create the middle- it will be a straight line that when connected will form a circle. There will be 5 flaps on each side.

d. Attach the top and bottom to the middle by the flaps.

e. Attach a ribbon or twine to the top as a hanger and then display in the classroom.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **SAE & Record Keeping** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 2.00 | 8% | C2 | Understand the use of records in the agricultural mechanics industry. |
| **OBJECTIVE:** | 2.01 | 4% | C2 | Understand the Supervised Agricultural Experience component of the agricultural mechanics program. |
| Sources of Information:  • "Curriculum." The Agricultural Experience Tracker. N.p., 2013. Web. 3 Mar. 2013. http://www.theaet.com | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Supervised Agricultural Experience**

A. The purpose of the SAE is to gain work experience in agriculture and build life skills.

B. SAE is a project completed outside of class time that deals with any division of agriculture:

1. Plants.

2. Animals.

3. Agriculture business.

4. Agriculture based science experiments.

**Six Major Types of SAE**

A. Entrepreneurship- planning, implementing, operating and assuming financial risks in an agricultural business or farming activity.

1. Examples: raising plants to sell, owning a lawn maintenance business or owning a farm supply store.

2. Record book- type of enterprise, amount of items bought or sold, expenses, income, efficiency factors, etc.

B. Experimental- planning and conducting an agricultural experiment using the scientific process or scientific method.

1. Example: comparing different fertilizer rates on plants.

2. Record Book- review of literature, hypothesis, data log, findings, recommendations, etc.

C. Analytical- identifying an agricultural problem that cannot be solved by experiments. It does include designing a plan to investigate and analyze the problem.

1. Example: making a marketing display.

2. Record Book-title of activity, identification of problem, background information, hypothesis, steps to solve problem, project log of what was done, results, and recommendations.

D. Placement- placing students in jobs outside the regular classroom hours. They may be paid or unpaid (volunteer) work.

1. Examples: working part-time at a small engine repair shop, at a farm supply store, at a greenhouse or for a landscape company.

2. Record Book- Ideally students should have a training agreement signed by student, teacher, employer and parent or guardian outlining work expectations. Records should be kept on the type of work performed, hours worked amount earned and income.

E. Exploratory- helping students learn about agriculture and become aware of possible agricultural careers through short times spent observing, shadowing or helping. You may have to combine more than one exploratory experience.

1. Examples: attending a career day, job shadowing a welder or interviewing an agricultural engineer.

2. Record Book- date, activity, observation and comments and hours.

F. Improvement- a series of activities that improves the value or appearance of the place of employment, school, home or community; the efficiency of a business or an enterprise; or the living conditions of the family.

1. Examples: building a fence, computerizing records, remodeling a building or repairing equipment.

2. Record Book- date started, date completed, improvement activity and steps or tasks involved in the project, hours, and costs.

**Additions to your SAE**

A. Supplementary- performing one specific agricultural skill outside of normal class time.

1. This skill is not related to the major SAE but is normally taught in an agricultural program, involves experiential learning and contributes to the development of agricultural skills and knowledge on the part of the student.

2. The activity is accomplished in less than a day and does not require a series of steps.

3. Examples: pruning a tree, painting a fence or changing oil.

4. Record Book- date, supplementary activities, comments and hours.

**Why Should I Have an SAE?**

A. Develop job skills.

B. Earn money.

C. Win FFA Awards.

D. Develop skills to start your own business.

E. Develop skills and knowledge that are helpful in college or work.

F. Learn about careers.

G. Keep accurate records.

H. Improve decision-making skills.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **SAE & Record Keeping** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 2.00 | 8% | C2 | Understand the use of records in the agricultural mechanics industry. |
| **OBJECTIVE:** | 2.01 | 4% | C2 | Understand the Supervised Agricultural Experience component of the agricultural mechanics program. |
| Activity Contributors:  • Ms. Christy Thornton- Agriculture Education Instructor Emeritus  • Michele Spence – Agricultural Education Instructor Emeritus | | | | |

**Suggested Activities 2.01**

|  |  |
| --- | --- |
| **Activity Number** | **Activity** |
| **2.01.01** | **Agricultural Experience Tracker** - Students complete SAE project and record information using the Agricultural Experience Tracker program: www.theaet.com. The following day-by-day instructions are provided by the Agricultural Experience Tracker program. These instructions are found under the “Teacher Help” section of the Agricultural Experience Tracker.  a. Day 1 - (In-class / computer lab) Print the Getting Students Started Guide (you should complete the Teacher Getting Started Guide prior)...Review your student accounts and print your list to provide the students with their username/password (log in as a teacher, Accounts & Account Management, then print your list). Either create a homework assignment, or take the class to a computer lab, to setup their AET accounts and complete their profile using this Getting Students Started guide.  b. Day 2 - (In-class presentation) Review AET educational Videos for each section of AET in class. These are available on Student Help section of AET. Review the Journals, Finances and Reporting sections in the AET. These are web-videos, so make sure to have a lab or classroom setup with speakers...or have students view individually as homework, and discuss the major points.  c. Day 3 - (In-class) Print the Setting Up an SAE Guide, and copy for the students to use as an in-class assignment. Have them review the guide, and brainstorm ideas about their SAE. Students may need multiple copies to develop several SAEs. Have them complete and turn in for a grade. Supplemental tools from the SAE Resources section may be used prior to this assignment.  d. Day 4 - (In-class & homework assignment), give students back their SAE ideas, and provide feedback on improving SAE ideas. Using a computer in class, go over the "Student Help" section of AET, and show students the Guides for building an SAE Plan. Depending on the type of SAE they've chosen, have them print the appropriate SAE Plan Guide, and complete a draft of their SAE Plan. As homework, have them setup their SAE in the AET (using their graded guide) and then using their SAE Plan guide, complete their SAE Plans in the AET.  e. Day 5 - (In-class handout- see activity #3), develop your grading rubric for students to grade record entries for the SAEs, their Classes, and their FFA activities in their AET. Grade record entries as part of each grading period (6 week grade). You can use the teacher grading report in your reports sections to create a report. In students managing their SAEs, you may handout guides for each type...Managing Entrepreneurship, Placement, Research and Exploratory SAE’s. |
| **2.01.02** | **Supervised Agricultural Experience 1st Nine Weeks Guidelines & Rubric** - Teachers can use this rubric and guideline to assist with grading and providing information for both the student and parent. This rubric is for the first nine weeks only. |
| **2.01.03** | **Supervised Agricultural Experience 2nd Nine Weeks Guidelines & Rubric** - Teachers use this rubric and guideline sheet to assist with grading and providing information to the student for the 2nd nine weeks of the semester. |
| **2.01.04** | **SAE Proposal Sheet** - Use this proposal sheet if students are not able to access the Agricultural Experience Tracker program or the teacher feels an additional worksheet is needed. |
| **2.01.05** | **SAE Match Game** - Students match the types of the SAE to statements that pertain to each category. |
| **2.01.06** | **SAE Matching –** Students will match the correct definition of an SAE, examples pf SAE’s and records. NOTE – they may use the type of SAE more than once in a section. |

**Activity 2.02.02**

**Supervised Agricultural Experience**

**1st Nine Weeks Guidelines & Rubric**

Student Username:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Student Password:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chapter Number:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dear Student & Parent/Guardian:

The SAE project is an opportunity for your child to gain additional knowledge and hands-on skills outside of regular class time. Each SAE project is uniquely designed by each student. All hours related to the project are completed outside of regular class time. Each student will keep records on the hours and provide pictures to document the work completed. These records are kept in the Agricultural Experience Tracker program. Your child already has their username and can access the Agriculture Experience Tracker from home. We encourage you to browse the website at www.theaet.com to become more familiar with the SAE project and the records your child will keep.

**Basic SAE Selection**

Name of Student:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name of Agriculture Class:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Semester/Year:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Type of SAE Selected: (circle one)

Improvement Placement Exploratory Entrepreneurship Experimental

Number of Hours Required for Project:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Brief Description of Project:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Parent/Guardian & Student Approval of Project**

Your signature indicates you have read the information above and understand the requirements of the Supervised Agriculture Experience project.

Parent/Guardian Signature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_

Student Signature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| **SAE Agriculture Experience Tracker**  **1st Nine Weeks Items to Complete** | **Due Date** | **Teacher Score** |
| Profile: About You: Manage/Edit Personal Profile-  • Students update membership information, demographic information and mobile device set-up. Also enter FFA membership information if applicable. |  | \_\_\_\_/10 |
| Profile: About You: Record you agriculture class schedule-  • Select and add the agriculture education class you are currently enrolled in. |  | \_\_\_\_/5 |
| Profile: Your Activities: Develop your AET Experiences-  • Create a new SAE “experience” if you are a new agriculture education student. OR  • Update/Edit Experience if returning agriculture education student. |  | \_\_\_\_/10 |
| Profile: Your Activities: Develop Your AET Experiences - Experiences Manager  • Select “Plan”- complete the following items: | | |
| 1. Description & Overview of SAE: Follow instructions provided. |  | \_\_\_\_/25 |
| 2. Estimated Investment of Time and Supervision: Follow instructions for completing information. See your agriculture education instructor for the minimum number of hours you must complete: Hour Requirement:\_\_\_\_\_\_\_\_ |  | \_\_\_\_/25 |
| 3. Learning Outcomes: The student must provide a minimum of 3 goals for the project. |  | \_\_\_\_/25 |
| Journal: Time in AET Experiences  • Begin recording time and complete journal entries for all hours worked.  • The student must record hours within 1 week of completing the activity to received full credit.  • Every journal entry must include detailed grammatically correct information. |  |  |
| Pictures  • A minimum of 10 pictures are required for all SAE projects.  • For Improvement type SAE projects, the student must show before, during and after pictures.  • The student should be visible in all pictures and demonstrate skills and tasks directly associated with the project.  • All pictures are uploaded and presented in the Agricultural Experience Tracker program. |  |  |
| Profile: Resume Information  • EXTRA CREDIT- complete for extra credit points: 2nd nine weeks |  |  |
| Profile: Record school & community involvement activities.  • EXTRA CREDIT- complete if applicable.  Counts towards extra credit points only. 2nd nine weeks. |  |  |
| **1st Nine Weeks Total Points** |  | \_\_\_\_/100 |

**Activity 2.02.03 Supervised Agricultural Experience**

**2nd Nine Weeks Guidelines & Rubric**

Student Username:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Chapter No:\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name of SAE Project:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

All SAE project items are due:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Any items not completed by this date will receive a 10% per day penalty.**

**NO SAE projects will be accepted after:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Congratulations! You are now in the “completion phase” of the SAE project where the student will record all hours worked, take pictures of the project and complete journals to record the activities they have completed. Here are detailed instructions on how to complete items that are due for your SAE during 2nd Nine Weeks:

A. To fill in Learning Outcome Skills:

1. Log into [www.theaet.com](http://www.theaet.com/).

2. Click on the “profile” tab.

3. Click on “Develop your AET Experiences.”

4. Click on “plan” for the AET Experience you are completing this semester.

5. Click on the “Learning Outcomes” tab.

6. Write 5 skills you learned and/or observed for your SAE project this semester. These skills should be written under the 3 goals you wrote during the 1st nine weeks.

7. Skills must be “measurable” and written in complete sentences using correct grammar and punctuation to receive full credit:

i. Example of student skills that WOULD NOT receive full points:

1. “Become a better person”

2. “Learn how to plant things.”

B. To record time and journals in the AET Tracker:

1. Log into [www.theaet.com](http://www.theaet.com/).

2. Click on the “journals” tab in the middle of the page.

3. Click on “Time in AET Experiences.”

4. Fill in the date you completed hours.

5. Select the category that the hours apply to:

a. If you have more than one SAE experience, then select the one you are completing for this semester.

6. Name the activity. Ex: “Building fence braces.”

7. Select the “type” of experience.

8. Write a journal that describes what activities you completed that day. Be specific. Use correct grammar and punctuation to receive full points.

9. Record the number of hours you worked in the “outside class” box.

10. Select who supervised you for this activity.

C. To upload pictures in the AET Tracker:

1. Log into www.theaet.com.

2. Click on the “portfolio” tab on the left hand side of the screen.

3. Click on “browse” and select the picture(s) you want to upload.

4. Click on “upload.”

5. Once pictures are uploaded, click on “edit” and complete the following:

a. Fill in the date the picture was taken in the “date” box.

b. Name the picture in the “title” box.

c. Click on the “experience” box and select your current AET Experience.

d. Write a minimum of 2 sentences explaining what you are doing in the picture.

6. Click“save” when complete.

7. Remember:

a. The student must have 10 pictures to receive full credit for this portion of your SAE.

b. For Improvement type SAE projects, the student must show before, during and after pictures.

c. The student should be visible in all pictures and demonstrate skills and tasks directly associated with the project.

|  |  |
| --- | --- |
| **SAE Agriculture Experience Tracker - 2nd Nine WeeksALL SAE ITEMS DUE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Teacher Score** |
| 1st Nine Weeks Score: | \_\_\_\_\_/10pts |
| AET Experience Learning Outcomes: During the 1st nine weeks, you wrote 3 goals you had for your project, now you need to write:  • 5 skills you learned and/or observed during the course of this project.  • Skills must be written in complete sentences and use correct punctuation and grammar to receive full credit. | Skill 1: \_\_\_\_\_/5pts Skill 2:\_\_\_\_\_/5pts Skill 3:\_\_\_\_\_/5pts Skill 4:\_\_\_\_\_/5pts Skill 5:\_\_\_\_\_/5pts |
| Journals & Time Log:  • Students enter time and complete a journal for each time you complete work for your SAE project.  • Students must record hours within 1 week of completing the activity to received full credit  • Every journal entry must include detailed grammatically correct information.  • You MUST complete a minimum of 15 hours to earn full credit.  • Incomplete or missing journal entries associated with the time recorded WILL NOT count towards hours completed.  • Students earn 3pts per hour completed and correctly recorded. | 3pts per hour    15 hours required    \_\_\_\_\_hours X 3 = \_\_\_\_\_/45pts |
| Pictures  • A minimum of 10 pictures are required for all SAE projects.  • For Improvement type SAE projects, the student must show before, during and after pictures.  • The student should be visible in all pictures and demonstrate skills and tasks directly associated with the project.  • Each picture MUST have a 2 sentence caption describing the skill and/or activity the student is completing.  • Each picture is worth 1 point for a total of 10 points.  • Each caption is worth 0.5 points for a total of 10 points. | 2pts per picture/caption    \_\_\_captions X .5 = \_\_\_\_/10pts    \_\_\_\_pictures X 1 = \_\_\_\_\_/10pts |
| **2nd Nine Weeks Points** | \_\_\_\_\_\_/100 |
| **Profile: Resume Information** • EXTRA CREDT | + \_\_\_\_\_/2pts |
| **Profile: Record school & community involvement activities**.  • EXTRA CREDIT- complete if applicable.  • Students earn 0.25pts for each school & community involvement activity for a maximum of 2pts added to overall SAE score. | +\_\_\_\_\_/2pts |
| **SAE 2nd Nine Weeks Final Grade** | \_\_\_\_\_/100 |

**Activity 2.02.04**

**SAE Project Proposal Sheet**

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period\_\_\_\_\_\_\_

The SAE (Supervised Agricultural Experience) is 30% of your final grade in this class. To receive an A you must put a minimum of \_\_\_ hours into your project. The SAE can be any project completed outside of class time that deals with agriculture (working with plant material, animals, or natural resources). Please be thorough in your planning of the project. You must obtain permission for your project from (teacher’s name) by using this proposal sheet and having your parent/guardian to sign the bottom.

This form is due on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. You will be provided a record book once your project has been selected and approved. The first three or four pages of the record book will be due \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_The completed record book will be due \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**(Due Today) Top two choices for my SAE project:**

1. Type of SAE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a. Project Description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Type of SAE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a. Project Description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Chosen Project is circled)

3. Timeline for Chosen Project:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Month1 | Month 2 | Month 3 | Month 4 | Month 5 |
|  |  |  |  |  |
|  |  |  |  |  |

4. Parent/Guardian Approval Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_

5. Student Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_

**Activity 2.02.05**

**SAE MATCH GAME**

With their table partner have the students cut out the headings (Types of SAE’s) and then the examples. They should place the examples under the appropriate heading. I have listed the answers below but you may put them under the category that best meets the SAE. (I look at Placement as a job, paid or not, that you will continue to do after the project is over and Exploratory as volunteering until your project is over). The teacher will walk around to the groups and check for correctness. If they miss one or more tell the students “Try again!” Give the group that wins a treat.

**SAE Match Game KEY**

Entrepreneurship: Breeding animal (fish, hamsters, dogs) for sale.

Starting a welding business.

Owning your own landscaping business.

Experimental: Will music have an effect on plant growth?

Do sports drinks make plants grow better than water?

Light color, do plants really care?

Analytical: What is causing the fish in the pond to die?

What could be the cause of electrodes not burning correctly?

What is the best marketing display for your annual bedding

plants?

Placement: Helping a neighbor after school on his farm on a regular

Basis.

Working in the produce section at Harris Teeter.

Repairing small engines for a local shop.

Exploratory: Visiting an irrigation engineer for no more than 10 hours.

Interviewing several people about agricultural careers.

Job shadow a florist for a day.

Improvement: Computerize records for your dad’s landscaping business.

Redesign a flower bed in your yard and plant new plants.

Build a fence to keep the deer out of your grandpa’s garden.

Supplemental: Changing the spark plugs in your own lawn mower.

Raking leaves in your yard. Feeding the cows once.

**SAE Match Game Headings Activity 2.02.05**

Entrepreneurship

Experimental

Analytical

Placement

Exploratory

Improvement

Supplementary

**SAE Match Game Examples Activity 2.02.05**

Breeding animal (fish, hamsters, dogs) for sale.

Build a fence to keep the deer out of your grandpa’s garden.

Computerize records for your dad’s landscaping business.

Do sports drinks make plants grow better than water?

Feeding the cows once.

Helping a neighbor after school on his farm on a regular basis.

Interviewing several people with agricultural careers.

Job shadow a florist for a day.

Light color, do plants really care?

Changing the spark plugs in your own lawn mower.

Owning your own landscaping business.

Raking leaves in your yard.

Redesign a flower bed in your yard and plant the new plants.

Starting a welding business.

Visiting an irrigation engineer for no more than 10 hours.

What is causing the fish in the pond to die?

What could be the cause of electrodes not burning correctly?

Will music have an effect on plant growth?

Working in the produce section at Harris Teeter.

What is the best marketing display for your annual bedding plants?

Repairing small engines for a local shop

**2.01.06 – SAE Areas, Examples and Records**

**DIRECTIONS** – for each section, match the type of SAE with its definition, example and records. Note – SAE Types may be used more than once in a section.

**Part 1 – Match the SAE type to its definition.**

A. Exploratory E. Entrepreneurship

B. Improvement F. Analytical

C. Supplementary G. Experimental

D. Placement

\_\_\_\_\_ Works for someone else, receives a wage.

\_\_\_\_\_ Ownership or partial ownership of an enterprise

\_\_\_\_\_ Allows one to look at various ideas or careers

\_\_\_\_\_ Involves studying a problem without conducting an experiment

\_\_\_\_\_ A onetime activity, usually not related to the student’s SAE

\_\_\_\_\_ Improves the appearance, efficiency, safety and productivity of the SAE, home, community

\_\_\_\_\_ Involves identifying the problem, forming a hypothesis, preparing a project, collecting data, drawing conclusions and preparing a written report

**Part 2 - Match each activity with the type of SAE listed above.**

\_\_\_ 1. Bill’s SAE is in small engine repair. He helped a neighbor transplant bedding plants.

\_\_\_ 2. Anna studied the Chicago Board of Trade trends for wheat, soybean and corn and

presented a report on her findings.

\_\_\_ 3. Blake was hired to work in a machine shop repairing lawn mowers.

\_\_\_ 4. Anthony is unsure of what type of SAE to complete, so he looks at various careers in

agriculture

\_\_\_ 5. Jonathan wants to learn more about the effects of additives used in gasoline. He sets up

his experiments using two cycle engines.

\_\_\_ 6. Anthony has been asked to use his knowledge about irrigation to design an irrigation plan

for his church to use with their new addition.

\_\_\_ 7. Mandy renovated the front porch on the family home in order to improve its safety.

\_\_\_ 8. Juan is starting up a business for his SAE in small engine repair and he rebuilt a rototiller.

\_\_\_ 9. Bethany is interested in the effects of temperature on the vase life of cut flowers. As a

result, she has a hypothesis, collects data and draws conclusions.

\_\_\_ 10. Tyler is raising his own crop of watermelons to sell at a local farmer’s market.

\_\_\_ 11. Karen visited the Welding Department at the Community College to learn more about

career opportunities.

\_\_\_ 12. Elizabeth researches online the types of careers in ag mechanics for soil management.

\_\_\_ 13. Kayla’s SAE is working at Lowe’s and requires a training agreement.

\_\_\_ 14. Emily installed an underground automatic water system in her front yard.

\_\_\_ 15. Brenda spent the day working with the naturalist at the county park nature trail

# **Part 3 – SAE Record keeping – Match the type of record keeping to the type of SAE**

A. Exploratory E. Entrepreneurship

B. Improvement F. Analytical

C. Supplementary G. Experimental

D. Placement

\_\_\_\_\_ Type of enterprise \_\_\_\_\_ Review of literature

\_\_\_\_\_ Supplementary activities \_\_\_\_\_ Dates and Observations

\_\_\_\_\_ Training agreement \_\_\_\_\_ Amount bought or sold

\_\_\_\_\_ Identification of problem \_\_\_\_\_ Data log and findings

\_\_\_\_\_ Date started and completed along with improvement activity

\_\_\_\_\_ Hours worked, wages earned

\_\_\_\_\_ Expenses and Income

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **SAE & Record Keeping** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 2.00 | 8% | C2 | Understand the use of records in the agricultural mechanics industry. |
| **OBJECTIVE:** | 2.02 | 4% | C2 | Understand methods of financial record keeping in an agricultural mechanics business. |
| Sources of Information:  • (NCSU SAE Record Book) | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Methods of Financial Record Keeping**

A. Terms

1. Asset – things a person owns that have value or can be seen.

a. Current--items quickly converted to cash or that will be sold within 12

months-examples: cash, checking, savings, stocks, and non-depreciable

inventory of crops, livestock, welding supplies, etc.

b. Non-current-items that have a useful life of more than one year--examples:

land, machinery, breeding livestock, etc.

2. Liabilities-Money or services that a person or business owe; debts

a. Current—debts that are due to be paid this year—examples: fertilizer and feed

bills, tractor and building payments, and part of mortgage due this year.

b. Non-current—debts not due this year—examples: mortgages not including this

year’s payment.

1. Net worth = total assets minus total liabilities, also known as equity
   * + - 1. Current assets + non-current assets = total assets
         2. Current liabilities + non-current liabilities = total liabilities

4. Inventory—an itemized list of things owned by a business with the beginning value and depreciated value.

a. Non-depreciable—items that will be used up or sold within a year—example:

feed, supplies, etc.

b. Depreciable—items that have a useful life of more than one year and lose

value because of age, wear or becoming out-of-date because of technology

advancements. Land is NOT depreciable property.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit A** | **SAE & Record Keeping** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 2.00 | 8% | C2 | Understand the use of records in the agricultural mechanics industry. |
| **OBJECTIVE:** | 2.02 | 4% | C2 | Understand methods of financial record keeping in an agricultural mechanics business. |
| Activity Contributors:  • Michele Spence - Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 2.02**

|  |  |
| --- | --- |
| **Activity Number** | **Activity** |
| **2.02.01** | **Financial Terms Matching –** Students will match the types of financial terms covered with types of records. Refer back to 2.01 for types of records for each SAE |
| **2.02.02** | **Applying Records –** Students will be given scenarios of various SAE’s and place the records in the correct place for each type of job. |

**2.02.01**

**Financial Record Keeping**

**Part 1 - Place the letter of the correct category in front of the item.**

1. Current Asset 3. Current Liabilities
2. Non-current Asset 4. Non-current Liabilities

\_\_\_\_\_ Land

\_\_\_\_\_ Equipment/Machinery

\_\_\_\_\_ Items used for Breeding/Reproduction

\_\_\_\_\_ Buildings

\_\_\_\_\_ Checking accounts

\_\_\_\_\_ Notes and accounts receivable

\_\_\_\_\_ Accounts payable (money you owe others)

\_\_\_\_\_ Accounts receivable (money others owe you)

\_\_\_\_\_ Rent

\_\_\_\_\_ Current Portion of mortgages, loans

\_\_\_\_\_ Non-Depreciable Inventory (plan to use or sell in the next twelve months)

\_\_\_\_\_ Depreciable Inventory

\_\_\_\_\_ Real Estate Mortgages

\_\_\_\_\_ Plants (Shrubs/Trees) kept for more than one year (Rootstock or needs more time to grow out)

**Part 2 – Figuring Net Worth and Debt-to-Equity Ratio**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Total Assets* | *Total Liabilities* | *Net Worth* | *Debt-To-Equity Ratio* |
| 1 | $300,000 | $75,000 |  |  |
| 2 | $425,958 | $857,269 |  |  |
| 3 | $257,593 | $248,956 |  |  |
| 4 | $248,321 | $169,793 |  |  |
| 5 | $1,358,127 | $674,218 |  |  |

**2.02.02**

**Complete an SAE Record Keeping Sheet**

**Placement**

Katie has taken a job at Lowe’s after school and on the weekends. During an average month, she will work from 4:00 PM to 7:00 PM Monday to Friday, 7:30 AM to 3:30 PM on Saturday and 1:00 PM to 6:00 PM on Sunday. She will have the last weekend off and is paid $8.50 per hour. Each week it averages 10 gallons of gas to go to and from work and gas has been $2.50 per gallon for the month. In addition, the first week she had to purchase a pair of safety glasses to wear for $6.00 to use in the cutting of materials. Complete the records for her placement activity based on her working hours for one month.

Placement – Katie

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Week of | Hours Worked | Wages | Total Income | Expenses |
| August 1 – 7 |  |  |  |  |
| August 8 – 14 |  |  |  |  |
| August 15 – 21 |  |  |  |  |
| August 22 – 28 |  |  |  |  |
|  |  | Totals for Month > > > > |  |  |

**Exploratory**

Joshua is interested in working in the agricultural mechanics area, but is unsure of which area that interests him the most. He has decided to do four job shadowing activities:

• August 15 from 1 – 5 PM at KNC

• September 22 from 8:00 AM to 12:00 PM at East Coast Equipment

• September 30 from 1:00 PM to 3:00 PM with William, a self-employed mechanic

• October 12 from 8:00 AM to 12:00 PM at Ivey’s Tractor Supply

In addition, he has spent 2 hours researching each of these career areas: underwater welder, irrigation designer and tractor repairman. Complete the records for his SAE activities.

Exploratory – Joshua

|  |  |  |  |
| --- | --- | --- | --- |
| Date of Visit OR Hours | Person/Place Visited OR  Work Completed | Hours Spent | Comments |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit B** | **Shop Safety Practices & Tool Safety** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 3.00 | 10% | C2 | Apply shop safety principles to work in an agricultural mechanics shop. |
| **OBJECTIVE:** | 3.01 | 6% | C2 | Understand OSHA safety rules, color coding, and personal and fire safety equipment and techniques in an agricultural mechanics shop. |
| Sources of Information:  • *Agricultural Mechanics: Fundamentals and Applications –* Unit 4 – Personal Safety in Agricultural Mechanics  • *Agricultural Mechanics and Technology Systems* – Chapter 5 – Safety and Developing Safe Working Habits | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

A. Safety Color Codes – used to alert people to dangers and hazards.

1. Green – safety equipment and first aid supplies

2. Red – fire safety equipment

3. Orange – dangerous parts of equipment.

4. Yellow – adjustments or controls on equipment

5. Blue – caution against starting out of working order equipment

6. Gray – floors

B. Focal Colors

1. Ivory – highlights edges of equipment to improve visibility.

2. Vista green – paints bodies of machines, stationary equipment, and cabinets.

3. Aluminum – paints waste containers.

C. Noise

1. Unit of measurement is decibels.

2. Hearing losses caused by level and time exposed

3. 90 decibels or higher is dangerous.

D. Safety Policy and Procedure Defined

1. Policy is a plan.

2. Procedure is an action.

E. Keys to Working Safely in the Agricultural Shop

1. Safety is when the workers are free from danger, risk, or injury.

2. Safety in agricultural mechanics shops depends mainly on the people who use the shops.

3. The major causes of accidents are unsafe actions by people and unsafe working conditions.

4. The best way to control accidents is prevention. Then next best approach is to use protective devices such as safety glasses, face shields, gloves, steel toe shoes, aprons, guards, etc.

5. To be safe and efficient, a shop must be large enough to have reasonable space for each person working in the shop.

6. A clean and well-organized shop decreases the chance of accidents.

7. An approved flammable materials cabinet improves shop safety by providing a safe place to store those materials and by automatically closing if there is a fire.

8. Tools and materials should be put in their proper places to save time and prevent accidents.

9. To help prevent back injuries, heavy objects should be lifted with the legs, not with the back.

10. Loose clothing, jewelry, and long hair can cause serious injury by getting caught in saws, drills and other equipment with rotating or turning parts.

11. The types of safety protection devices needed depend on the work being done in a shop, but the minimum protection should be wearing safety glasses at all times.

12. For welding wear a Shade 5 for Oxy-Fuel, a Shade 10 should be used for SMAW and a Shade 12 for MIG.

13. The best protective clothing for agricultural workers is coveralls. Leather

gloves are used for welding to prevent burns.

F. Causes of Farm Accidents

1. Farm machinery – 44% - almost half

2. Drowning – 12%

3. Hit by objects – 9%

4. Electrical current – 7%

5. Firearms – 5%

6. Falls – 5%

7. Others – 18% includes burns, animals, poisons etc.

G. Classes of Fires

1. Class A is caused by ordinary combustibles such as wood or paper. Symbol is green triangle.

2. Class B is caused by flammable liquids such as gasoline or solvents. Symbol is a red square.

3. Class C is caused by electricity. Symbol is a blue circle.

4. Class D is caused by combustible metals. Symbol is a yellow star.

H. Types of Fire Extinguishers to Use

1. Water is used for Class A fires.

2. Carbon dioxide (CO2) is used for Classes B and C fires.

3. Dry chemical is used for Classes A, B, and C fires.

4. Only Class D extinguishers will work on burning metals.

5. Extinguishers should be located 3 ½' to 5' above the floor so that they will be easy to reach.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit B** | **Shop Safety Practices & Tool Safety** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 3.00 | 10% | C2 | Apply shop safety principles to work in an agricultural mechanics shop. |
| **OBJECTIVE:** | 3.01 | 6% | C2 | Understand OSHA safety rules, color coding, and personal and fire safety equipment and techniques in an agricultural mechanics shop. |
| Activity Contributors:  · Michele Spence - Agriculture Education Instructor Emeritus  · Reed Ledbetter – Agriculture Education Instructor, Scotland High School  · Michael Hayward Bowden – Agriculture Education Instructor – Fuquay-Varina HS | | | | |

**Suggested Activities 3.01**

|  |  |
| --- | --- |
| **Activity Number** | **Activity** |
| **3.01.01** | **Personal Safety in the Shop –** Students will complete a foldable using a tri fold on plain paper. They will create a cover and then complete information for each of the sections using materials from the notes or as the teacher is giving the material in class. |
| **3.01.02** | **Colors in the Shop** – Students will complete the worksheet on the various colors found in the shop using their notes or the textbook. In the far right column under color, they are to color in the color noted. |
| **3.01.03** | **Fire Extinguishers –** Students are to complete the activity on the types of fire extinguishers based on what they control and the symbol. They are to color the symbol the correct color. |
| **3.01.04** | **Safety Test –** The instructor will use an approved safety test to determine the student’s ability to function in the shop and know basic safety rules and procedures. |
| **3.01.05** | **The Ten Shop Commandments –** Students will develop a safety booklet using the provided instructions. |
| **3.01.06** | **“It Didn’t Have to Happen” on You Tube**  <https://www.youtube.com/watch?v=xxw5gl1Z2Yk>  Have student answer the questions about the video and discuss the questions. It helps to be in the shop while discussing it, if possible! |

**3.01.01 – Personal Safety in the Shop**

**Directions for Teacher** – Have each student take a sheet of printer paper (8 ½” x 11”) and fold into three equal parts, like a pamphlet.

Instruct them to make a cover with their name, class and period

In the panels, have them complete the notes there from the outline, setting up the panels as follows:

|  |  |
| --- | --- |
| *Outside Panels One Side of Sheet* | *Inside Panels Back Side of Sheet* |
| Causes of Farm  Causes and Prevention | Safety Color Codes  Focal Colors |
| Fire Extinguishers | Noise  Safety is. . .  Housekeeping |
| Cover | Other Safety Rules |

**3.01.02 – Colors in the Shop**

**DIRECTIONS:** Complete the color meaning and where to find in the center column. In the right column, use color pencils or crayons to fill in the color.

|  |  |  |
| --- | --- | --- |
| ***Color*** | ***What it Means/Where to Find*** | ***Color*** |
| **Green** |  |  |
| **Gray** |  |  |
| **Orange** |  |  |
| **Red** |  |  |
| **Blue** |  |  |
| **Yellow** |  |  |
| **Ivory** |  |  |
| **Aluminum** |  |  |

**3.01.01.03 – Classes of Fires and Fire Extinguishers**

|  |  |  |  |
| --- | --- | --- | --- |
| Class of Fire | Material Burning | Type of Extinguisher | Symbol/Color |
|  |  |  |  |
|  |  |  |  |
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|  |  |  |  |

**BONUS:** How high should fire extinguishers be located from the floor? Why?

**3.01.05**

**The Ten Shop Commandments**

**DIRECTIONS** – You are the safety engineer (aka shop foreman) at Southeast Farm Equipment in Laurinburg, NC. You have been asked by the president of the company to develop a shop safety booklet for all shop employees as the insurance rates will go up if this document is not in place.

The booklet is to be developed using the engineering design process which is:

· **Ask –** What is the problem?

· **Imagine** – What could be some solutions?

· **Plan** – Draw a diagram.

· **Create –** Follow your plan

· **Improve –** Make your design better.

The booklet must include 10 safety rules with illustrations, types of fire extinguishers, the meaning of OSHA and the color codes for the shop. The booklet will be graded on the following rubric.

|  |  |  |
| --- | --- | --- |
| ***Project Component*** | ***Graded on*** | ***Points*** |
| Book Design | Creativity | 40 points |
| Neatness | Make it “Sharp” | 20 points |
| Appeal | Make it “Wow” | 20 points |
| Color | Make it “Pop” | 10 points |
| Correct | Make it “Right” | 10 points |

**3.01.06**

**“It Didn’t Have to Happen”**

**Video Questions**

1. List the stationary power tools mentioned in the video. How many have safety guards on them?

2. Reflecting upon the safety rules you have learned in class, list the safety violations you see occurring in the first five minutes of the video.

3. What was dangerous about the behavior “Lucky Williams” was demonstrating at his work station?

4. Which character in the video, has evidently had a severe accident in the past? What was his injury?

5. Specifically what safety rule did the jointer operator violate when he was hurt? What was the end result?

6. What is the primary function of the splitter and “dogs” on the table saw guard?

7. What does the film say about setting table saw blade height vs. what is now considered safe practice in setting the table saw blade height?

8. How did the shaper operator solve the unsafe problems found at his machine? What principles of machine safety and maintenance did he demonstrate, that we can use in operating the equipment in our shop?

9. What was the end result of all the unsafe habits in the shop shown on the video? Did “It” have to happen?

10. Besides the safety recommendations shown in the video, what other safe practices would you recommend following to keep accidents from happening in a shop?

**Shop Tool Operation and Safety Brief Lesson Plan**

Watch the Video “It Didn’t Have to Happen” on You Tube

<https://www.youtube.com/watch?v=xxw5gl1Z2Yk>

· Have student answer the questions about the video and discuss the questions.

· It helps to be in the shop while discussing it, if possible!

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit B** | **Shop Safety Practices & Tool Safety** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 3.00 | 10% | C2 | Apply shop safety principles to work in an agricultural mechanics shop. |
| **OBJECTIVE:** | 3.02 | 4% | C2 | Apply safe work practices when setting up, adjusting, and using hand and power tools. |
| Sources of Information:  • *Agricultural Mechanics: Fundamentals and Applications* – Unit 7 – Hand Tools, Fasteners and Hardware  • *Agricultural Mechanics: Fundamentals and Applications* – Unit 14 – Portable Power Tools  • *Agricultural Mechanics: Fundamentals and Applications* – Unit 15 – Woodworking with Power Machinery  • *Agricultural Mechanics and Technology Systems* – Chapter 6 – Measuring and Marking Tools  • *Agricultural Mechanics and Technology Systems* – Chapter 7 – Hand Tools  • *Agricultural Mechanics and Technology Systems* – Chapter 8 – Power Tools | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Agricultural Mechanics Hand Tools**

A. Using Hand Tools

1. Hand tools used for cutting should be sharp to improve safety and efficiency.

2. Using the proper tool for the job can reduce or eliminate injuries.

3. Fine or small teeth on a saw blade make a smoother cut, but coarse or large teeth cut faster.

B. Hand Tools and Their Uses

1. Adjustable wrench is used to turn various sizes nuts and bolts.

2. Brick trowel is used to place and spread mortar.

3. Ball peen hammer is used to hammer metal objects such as punches, chisels, or parts of small engines.

4. Cold chisel is used to cut metal.

5. Combination square is used to mark 45° and 90° angles.

6. Combination wrench is used to turn both hex and square nuts.

7. Concrete float is used to level concrete.

8. Coping saw is used to cut curves in wood.

9. Countersink is used to flare the top of a hole to recess the head for a flathead screw or bolt.

10. Crosscut saw blade is used to cut across the grain of wood.

11. Hacksaw is used to cut metal, and there should be at least three teeth in contact with the metal.

12. Long nose pliers are used to reach into recessed areas.

13. Measuring tools for wood are usually divided into 16 parts per inch or 1/16ths.

14. Miter saw is used to cut angles.

15. Nail hammer is used to drive nails to fasten one board to another.

16. Ripping hammer is used to remove wood and to drive nails.

17. Rip saw blade is used to cut with the grain of wood.

18. Slip joint pliers are used to hold various sizes of materials.

19. T bevel is used to find and transfer various angles.

20. Try square is used to mark 90° angle.

21. Vise grip pliers are used for extra firm holding or gripping.

22. Wire strippers are used to remove insulation from electrical wires, to gauge wires sizes, and to crimp terminals.

23. Wrecking bar is used to rip and pry wood.

**Guidelines for Using Specific Agricultural Mechanics Hand Tools**

A. Hammers

1. The handle should be held near the end away from hammer head to improve accuracy and leverage.

2. Large nails require the use of a heavier hammer than small nails.

3. Using nails to fasten wood is fast, but results in the weakest joint.

4. Many types of nails are available. The correct type should be used for the job. These are covered in 4.03.

B. Measuring and Marking Tools

1. “Measure twice, cut once” is a good rule to follow to reduce the amount of wasted time and materials.

2. Most wood measuring tools are divided into 1/16" marks. The shortest lines on the rule are usually 1/16" measurements.

3. The string of a chalk line should be stretched tight and snapped in the middle to mark an accurate long straight line.

4. A scratch awl, file, or scriber can be used to mark a scratch on metal.

5. Soapstone is used to mark metal without leaving a permanent scratch.

C. Metal Cutting Tools

1. Files – since files only cut on the forward stroke, pressure should be reduced on the backstroke.

2. Hacksaws – Teeth should point away from the handle because most cutting is done on forward strokes.

3. Taps and dies – When used to cut threads in metal, oil should be used for lubrication.

D. Screwdrivers

1. Use the correct size and type for the job.

2. A heavy duty screwdriver has a square shank so that a wrench can be used to help remove large screws.

E. Saws

1. DO NOT saw out the marked line because board will be too small if it was measured and marked accurately. Saw on waste side of mark.

2. Hand crosscut saw is used to cut off across the grain.

3. Hand ripsaw is used to rip a board with the grain.

4. Coping saw has a very narrow, thin blade that can be removed and inserted in a hole to saw out a hole in the middle of a board. It can be used to cope molding and to saw curves.

F. Squares

1. Handle should be held firmly against board edge.

2. The combination square can be used as a miter square, plumb bob, level, depth gauge, marking gauge, and inside and outside try square.

3. A framing square has rafter tables engraved into the square.

G. Sanding Blocks

1. Sand with the grain and use fine or very fine sandpaper to prevent scratches.

2. Coarse sandpaper is used to remove large amounts of wood when sanding, but it leaves scratches in the wood.

3. Finishing sandpaper should always be used after using coarse paper to remove scratches.

4. Sanding should be performed with the grain if at all possible

**Agricultural Mechanics Power Tools**

A. Tools and Their Uses

1. Abrasive cutoff saw uses a circular blade to cut metal.

2. A nail gun is used to drive nails.

3. Band saw uses a thin, continuous, flexible blade to cut either curved or straight lines.

4. Circular saw makes straight cuts in wood.

5. Compound miter saw is a cutoff type saw used to cut angles and square cuts.

6. Drill makes round holes through wood or metal using a bit.

7. Drill press is a stationary tool used to make round holes in wood or metal using a bit.

8. Grinder shapes, removes and smoothes metal, sharpens tools, or removes rust.

9. Hacksaw is a stationary power tool that uses a blade with back and forth motions to cut metal.

10. Hammer drill is used to drill holes in masonry.

11. Jig saw uses a back and forth (up and down) motion blade to cut curves.

12. Jointer is used to straighten and smooth edges of boards or to cut bevels.

13. Planer smoothes and cuts lumber to exact thickness.

14. Radial arm saw moves to cut a stationary piece of wood.

15. Reciprocating saw is used in tight or close situations in remodeling work.

16. Router is used to make molding or designs in wood surfaces, dado cuts, and rabbet cuts.

17. Sander smoothes wood surfaces.

18. Sabre saw cuts curves in wood or other materials.

19. Table saw is used to crosscut, rip, dado or miter.

B. **Basics of Using Power Tools**

1. Cutting tools should be sharp to improve safety and efficiency.

2. General Rules

a. Care should be taken to use guards and to keep hands and clothing away from cutting parts of tools and equipment.

b. All safety procedures should be followed.

**Guidelines for Using Specific Agricultural Mechanics Power Tools**

A. Band Saw

1. Short or sharp curves in wood require a narrow blade – ¼" or less.

2. To help prevent the wood from binding, the miter gauge and the rip fence should never be used at the same time.

3. A band saw used to cut metal must have a speed control that will slow the blade speed, and a metal cutting blade must be used.

B. Drill

1. A center punch should be used to dent the metal before starting to drill a hole in metal.

2. The bit should be tight in the chuck, and the chuck key removed before using a drill.

C. Jointer

1. The depth of cut should be about 1/16" for each pass.

2. The depth of cut is determined by adjusting the front in-feed table.

D. Planer

1. Depending on the wood type (hardwood or softwood) around 1/16" of wood should be removed on each pass to avoid “tear out” where the wood will rip out and make giant craters.

2. Nails, dirt and loose knots should be removed before the board is planed.

3. The thin end of a rough-cut board should be put in the planer first. The last pass of the wood in a planer or jointer should be with the wood grain.

E. Portable Grinder

1. Operator should use both hands with a portable grinder.

2. It is unsafe to use a grinding wheel after one half its original diameter is worn away.

F. Portable Saws

1. Operator should use both hands with a portable saw.

2. Circular saw is used to make straight crosscuts or rip cuts in wood.

3. Saw teeth should point toward front of saw used to cut wood.

4. Other types of portable saws include sabre, jig, scroll, and reciprocating.

G. Radial Arm Saw

1. The wood remains stationary on the saw table, and the saw is pulled to the wood.

2. The wood should be held firmly against the fence while cutting. Long pieces should be supported.

3. The saw should be secured after each use.

H. Sanders

1. Belt sander requires operator to use both hands.

2. Belt should be turning before it is gently touched to the wood, and it should continue to run and be moved with the wood grain until it is lifted from the wood when finished.

3. After use, a belt sander should be laid on its side.

4. A finishing sander should be used to sand with the grain to get a smooth finish.

I. Table Saw

1. If a board is ripped less than 3" wide, a push stick should be used.

2. To get the correct board width, measure from side of fence nearest saw blade to the saw blade tooth nearest the fence.

3. Install the correct blade for the job with the teeth pointing toward the direction of rotation of the saw motor.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit B** | **Shop Safety Practices & Tool Safety** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 3.00 | 10% | C2 | Apply shop safety principles to work in an agricultural mechanics shop. |
| **OBJECTIVE:** | 3.02 | 4% | C2 | Apply safe work practices when setting up, adjusting, using hand and power tools. |
| Activity Contributors:  · Michele Spence – Agriculture Education Instructor Emeritus  · Reed Ledbetter – Agriculture Education Instructor,  · Michael Hayward Bowden – Agriculture Education Instructor – Fuquay-Varina HS | | | | |

**Suggested Activities 3.02**

|  |  |
| --- | --- |
| **Activity Number** | **Activity** |
| **3.02.01** | **Tools Matching** – As a pretest, study guide or test, have students complete the matching test. |
| **3.02.02** | **Proper Use of Tools –** Students will demonstrate proper use of hand and power tools to their instructors |
| **3.02.03** | **Reading A Ruler –** Visit<http://www.math-aids.com/Measurement/Measuring_in_Inches.html> to develop worksheets for students to practice measuring with a ruler. |
| **3.02.04** | **Safety Tests –** Instructors will give a safety test for the major power equipment that students will be using in their shop. |
| **3.02.05** | **Tools of the Trade Tool Booklet –** Students will complete a tools booklet to be used to learn about hand and power tools. |
| **3.02.06** | **Skills Checklist –** Students should be able to perform the skills listed safely and correctly. |
| **3.02.07** | **Tool Id –** Using tools in the shop, the instructor will layout the tools covered in this Objective and give a test to students on the tools for correct identification. |
| **3.02.08** | **DVD’s –** The following are DVD’s that match the material being covered and could be used as supplemental material.  From the History Channel  · Tool Bench – Power Tools  · Tool Bench – Hand Tools  · More Hardware  · Ruler DVD  Woodworkers Supply (<http://woodworker.com/>) has many DVD’s on wood working tools |
| **3.02.09** | **Virginia Tech's Agriculture Engineering** – They have a very good bank of safety test lessons and materials. The link is <http://www.alce.vt.edu/teacher-resources/> |

**3.02.01 – Tools and Their Uses – Matching**

\_\_\_\_\_ 1. Adjustable Wrench a. cut curves in wood

\_\_\_\_\_ 2. Brick Trowel b. to rip and pry wood

\_\_\_\_\_ 3. Ball Peen Hammer c. cut angles

\_\_\_\_\_ 4. Cold Chisel d. find and transfer various angles

\_\_\_\_\_ 5. Combination Square e. level concrete

\_\_\_\_\_ 6. Combination Wrench f. cut metal

\_\_\_\_\_ 7. Concrete Float g. cut with the grain of wood.

\_\_\_\_\_ 8. Coping Saw h. hold various sizes of materials

\_\_\_\_\_ 9. Countersink i. turn various sizes nuts and bolts.

\_\_\_\_\_ 10. Crosscut Saw Blade j. remove wood and to drive nails

\_\_\_\_\_ 11. Hacksaw k. to place and spread mortar

\_\_\_\_\_ 12. Long Nose Pliers l. mark 45° and 90° angles.

\_\_\_\_\_ 13. Measuring Tools m. for extra firm holding or gripping.

\_\_\_\_\_ 14. Miter Saw n. used to turn both hex and square nuts

\_\_\_\_\_ 15. Nail Hammer o. mark 90° angle.

\_\_\_\_\_ 16. Ripping Hammer p. drive nails to fasten one board to another

\_\_\_\_\_ 17. Rip Saw Blade q. flare the top of a hole to recess the head

for a flathead screw or bolt.

\_\_\_\_\_ 18. Slip Joint Pliers r. cut across the grain of wood

\_\_\_\_\_ 19. T Bevel s. cut metal at least three teeth in contact with

the metal.

\_\_\_\_\_ 20. Try Square t. reach into recessed areas

\_\_\_\_\_ 21. Vise Grip Pliers u. divided into 16 parts per inch or 1/16ths

\_\_\_\_\_ 22. Wire Strippers v. hammer metal objects such as punches

\_\_\_\_\_ 23. Wrecking Bar w. remove insulation gauge wires sizes, crimp

**3.02.05 - Tools of the Trade Tool Booklet**

DIRECTIONS – You are an agriculture teacher at Crest High School and have been asked to develop a tool booklet for the middle grades as an introduction to Agriculture Mechanics.

The booklet must include 72 tools from the official tool chart. The 72 tools must include:

· 12 plumbing tools

· 12 electrical tools

· 12 carpentry tools

· 12 fasteners

· 12 masonry tools

· 12 mechanic tools.

Each tool must include the proper name, the proper use and a small drawing of the tool. The cover page must include the title Tools of the Agriculture Shop with colorful illustrations.

The back cover should include a name and pictures of your 6 most useful tools and uses.

**3.02.06 – Skills Checklist**

Skills for Agriculture

1. Drive 8d nails in 2x4

2. Pull nails with hammer and wrecking bar and nail puller

3. Set finishing nails with nail set, fill and sand

4. Drill hole with portable and electric drill in wood

5. Mark and square board and cut wood with hand saw

6. Mark and square board and cut wood with skill saw

7. Mark and square board and cut wood with arm saw

8. Mark board and cut on table saw.

9. Glue boards

10. Use hacksaw to cut metal and steel rod

11. Cut metal with chop saw

12. Grind and file metal, grinder and file

13. Cut metal with tin snips

14. Cut metal with a cold chisel

15. Screw screws with screw driver blank and pilot hole

16. Screw sheet metal and self-tapping screw

17. Drill hole in metal, hand drill with center punch

18. Drill hole in metal, drill press with center punch

19. Drill hole and make tap

20. Cut rod and thread for bolt.

21. Put correct air pressure in tire

22. Dig a post hole and place a post

23. Staple wire to a post

24. Set and climb ladder

25. Change a tire

26. Change blade on band saw, fold blade

27. Make sign with router

28. Hand sanding and belt sander

29. Make sign with dremel

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.01 | 3% | C2 | Understand the use of a builder's level, tripod, laser level and the 3-4-5 method to layout a building. |
| Sources of Information:  • *Agricultural Mechanics Fundamentals and Applications* – Unit 40 – Planning and Constructing Agricultural Structures  • *Agricultural Mechanics and Technology Systems* – Chapter 13 - Surveying | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**A.** **The three basic types of leveling instruments used in agriculture are Builder’s Level, Tripod Level, and Laser Level**

1. The **Builder’s levels** is used to sight level lines and to lay out or measure angles only in the horizontal plane.

2. **Tripod Level** – transit can be used to lay out vertical lines as well as horizontal lines.

3. **Laser beam level** uses an electronic laser level transmitter unit.

B. Principles for using a level correctly include:

1. The tripod should be set up so that it is level and steady, not shaky.

2. To set up a tripod and builder’s level, these steps should be followed:

1. Loosen the wing nuts and spread tripod legs 3’ to 4’ apart.
2. Push tripod legs firmly into the ground.
3. Adjust tripod legs so that tripod head looks level.
4. Tighten all wing nuts.
5. Remove level from case and handle by the base.
6. Attach instrument to tripod.
7. Adjust leveling screws so that bubble is centered between centering marks of leveling vial.
8. Rotate telescope 90 degrees and repeat step 7 above.
9. Rotate telescope 90 degrees back to original position, recheck, and adjust

screws as needed to level.

1. Rotate telescope to any position to check for level.

3. The leveling rod should be held straight up to get an accurate measurement.

4. When the signal is seen or heard from the middle sensor on the rod, the

instrument person knows that the laser receiver unit is on the same grade.

5. For accuracy, the leveling vial of a level should be checked before and after each

reading.

6. To lay out square corners, the telescope is turned so that the angle of each

corner is 90 degrees.

7. Leveling instruments are precision instruments and should be handled carefully.

**Using the 3-4-5 method to lay out a building**.

A. The 3-4-5 method of laying out a building uses the principle of a right triangle to square the corners and obtain dimensions.

B. The procedure for laying out a building using the 3-4-5 method includes these steps:

1. Stake out a baseline.

2. Set front corner stake A on the baseline.

3. Measure the building length from stake A and set stake B.

4. Measure 3’ from Stake B down baseline and set a temporary stake.

5. Measure 4’ from stake B toward new corner C and 5 feet from temporary stake to the location where 4’ and 5’ measurements meet and set a second temporary stake.

6. Measure the width of building along this new line and set the third corner stake C.

7. Measure building length from stake C, measure building width from stake A, and place stake D where the two measurements meet.

8. Check both diagonals from opposite corners to see that they are equal. If not equal, move corner stakes until both diagonals are equal to make layout corners square.

C. If two measurements are 30' and 40', the other measurement would be 50' to make a square corner. If the two measurements are 18' and 24', then the other measurement would be 30', a 3-4-5 ratio.

**Importance of laying out a building square**

If the layout of a building is not square, then the building will not be square causing problems throughout the construction.

**Procedure for determining if a building is laid out square**

One method is to check the layout of a square or rectangular building to be sure it is square, the two diagonal measurements must be equal to each other.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.01 | 3% | C2 | Understand the use of a builder's level, tripod, laser level and the 3-4-5 method to layout a building. |
| Activity Contributors:  • Michele Spence - Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 4.01**

|  |  |
| --- | --- |
| **Activity Number** | **Activity** |
| **4.01.01** | **Setting up a Tripod** – Instructors should go through and allow students to set up a tripod and understand how to operate and read the tripod. |
| **4.01.02** | **Demonstrate the 3-4-5 Method** – Instructors should demonstrate the proper method for laying out a building |
| **4.01.03** | **NCFFA Agricultural Mechanics CDE Performance Skill 8 –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics. The scenario for this skill is:  *Level transit and determine difference in elevation between two points.* |

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.02 | 5% | C2 | Apply drawings and symbols to develop a project plan and complete a bill of materials. |
| Sources of Information:  • *Agricultural Mechanics Fundamentals and Applications* – Unit 17 – Sketching and Drawing Projects  • *Agricultural Mechanics and Technology Systems* – Unit 10 – Project Design and Planning | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Sketching Construction Plans and Drawings**

**Advantages of plans** – Plans drawn on paper save time and money because changes are faster and less expensive to make on a plan than on the real structure.

**Types of drawings** used in construction include **sketches**, **hand drafted drawings**, and **computed assisted drawings**.

1. Drawings are based on the views of the object or the dimensions.

2. Orthographic or two-dimensional view drawings represents two views of the

object.

3. Isometric or three-dimensional view drawings show the object as a whole instead

of parts and shows the object in a form similar to a picture and is drawn to scale

4. Perspective is similar to isometric because it is three-dimensional and appears

on the drawing as it does to the eye, but it is NOT drawn to scale.

5. Sectional view shows a vertical cross-section of the object.

6. Mechanical drawings are used when a detailed description is needed.

7. A three-view drawing is used to show the front, top, and end of the object

**Identifying Blueprint Terms and Symbols**

A. Different types of lines are used to indicate different things on a drawing.

1. A dark solid line is used for the border, and a thinner solid line is used as an

object line.

2. A series of dashes is used to show a hidden line.

3. A leader line is a solid line with an arrow that has words such as “vinyl siding” or

“metal siding” in front of the line and arrow.

4. Dimension lines have a line with an arrow, a measurement number such as

5'-10" between, and another line with an arrow on the right side of the dimension.

B. Scale represents the actual building dimension with a measurement on the drawing. Example: ¼"=1'-0"

**Reading blueprints to plan layout and framing**

A. A blueprint has a legend that shows the meaning of different symbols.

B. Two-dimensional drawings are usually used and may have one or all of the following

views:

1. Site plan is like an aerial view of the location and what is on it.

2. Plan view is the same as the floor plan.

3. Elevation views show the front, back, left side, and right side of a building.

4. Sectional view shows what would be seen if the building were cut in two to show a cross section of the wall.

5. Detail view shows special features on a larger scale so that it can be seen easier.

6. Auxiliary drawings show such things as plumbing, electrical, framing, foundation, and doors and windows.

C. If each side of a building is different, four views (one for each side) are needed by a builder.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.02 | 5% | C2 | Apply drawings and symbols to develop a project plan and complete a bill of materials. |
| Activity Contributors:  · Michele Spence - Agriculture Education Instructor Emeritus  · Donald Mooring – South Lenoir High School Drafting Instructor | | | | |

**Suggested Activities 4.02**

|  |  |
| --- | --- |
| **Activity Number** | **Activity** |
| **4.02.01** | **Scales and Lines** – students will use information obtained from notes to complete the activity on drawing lines using architect and engineer scales. |
| **4.02.02** | **Types of Drawings** – Using resources available (internet, magazines, etc.) students are to create a PowerPoint or a poster and give an example of each of the following types of drawings:  · Orthographic or two-dimensional view  · Isometric or three-dimensional  · Perspective  · Mechanical  · A three-view drawing  · Site plan  · Plan view or floor plan.  · Elevation views  · Sectional view  · Detail view.  · Auxiliary drawings |
| **4.02.03** | **Read a Blueprint –** Students will read the provided blueprint and answer questions about the plan. |
| **4.02.04** | **Identify Types of Blueprints –** Using their notes, students should be able to identify the types of plans used in the construction industry. |

**4.02.01 Scales and Lines**

Part 1 – Reading a Scale

Using the **CORRECT** scale, measure and draw the following lines. You have be given a short piece of line to help you get started

28’ @ 1"=10’ ----

6’ 3" @ ¼" = 1’ ----

35’ @ 1" = 30’ ----

20’ 6" @ 1/8" = 1’ ----

123’ @ 1"=40’ ----

250’ @ 1"=60’ ----

18’ 6" @ ¼"=1’ ----

1500’ @ 1"=200’ ----

310’ @ 1"=50’ ----

33’ 6" @1/8"=1’ ----

Part 2 – Answer the questions below

1. The Engineer’s scale is based off of:

2. The Architect’s scale is based off of:

3. Draw the correct lines below:

Border Line

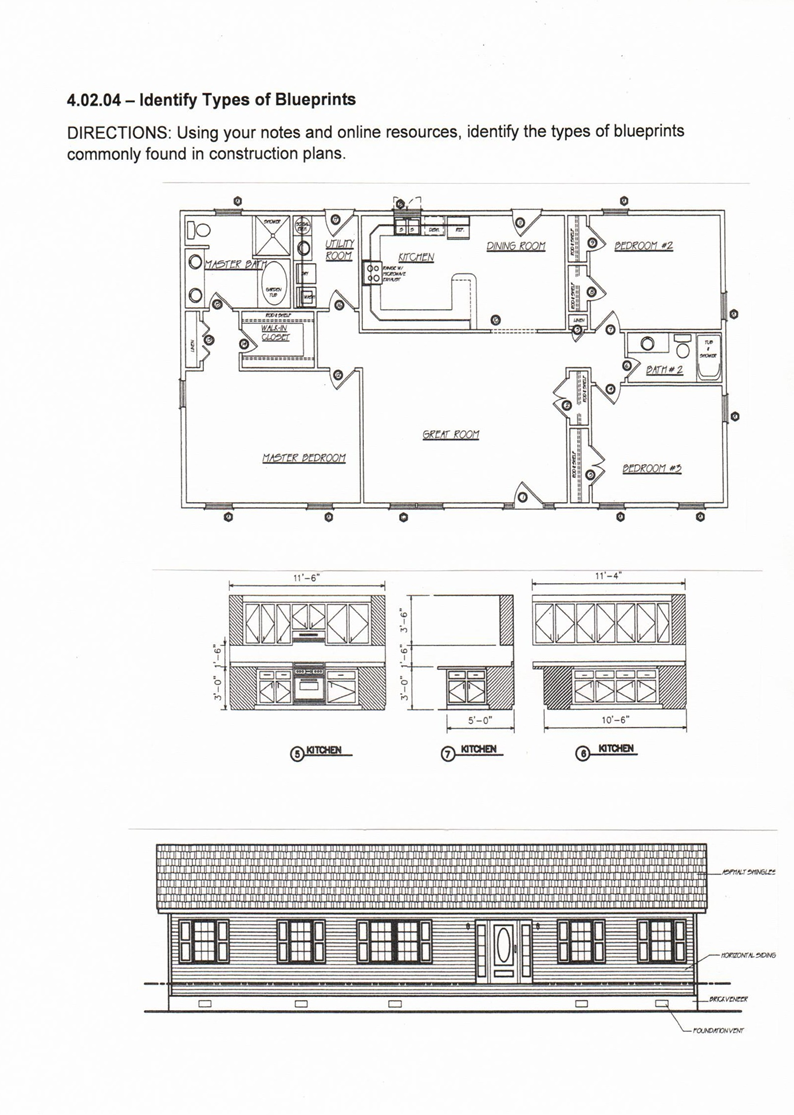
Object Line

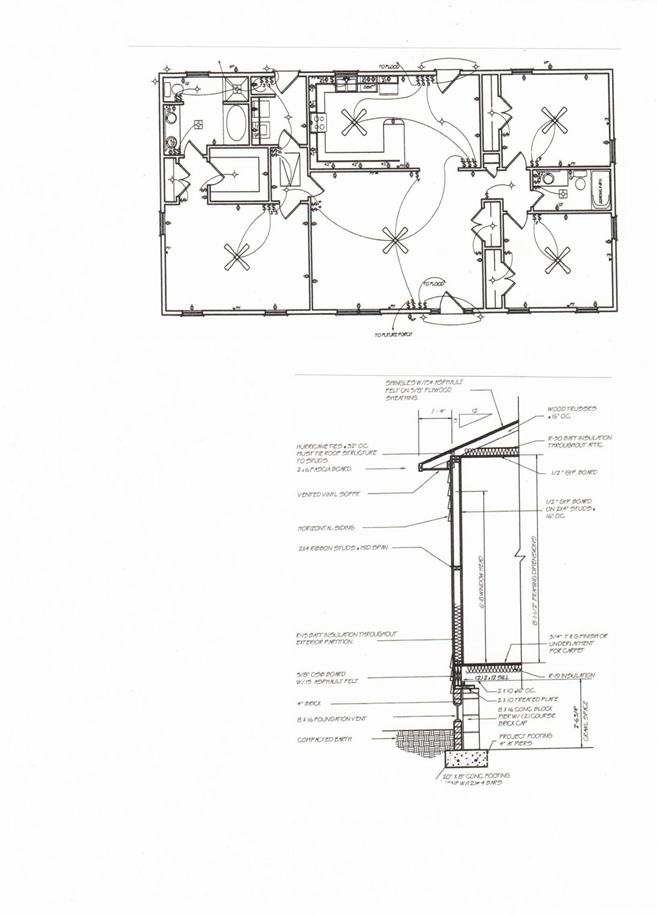
Hidden Line

Leader Line

Dimension Line

Center Line





**4.02.03 – Reading a Blueprint**

**DIRECTIONS**: Using your notes and online resources, answer the questions below about the blueprint provided.

1. Draw the symbol for a door.

2. How many exterior doors are needed in this plan?

3. How many interior doors are needed?

4. Draw the symbol for a window.

5. How many windows are required?

6. How many bathroom sinks will be needed?

7. How many ceiling fans will be used?

8. How many light switches will be needed?

9. How are Ground Fault Interrupters (GFI) symbolized?

10. How many (GFI) outlets will be needed?

11. Where are these located?

12. Draw the symbol for an overhead light.

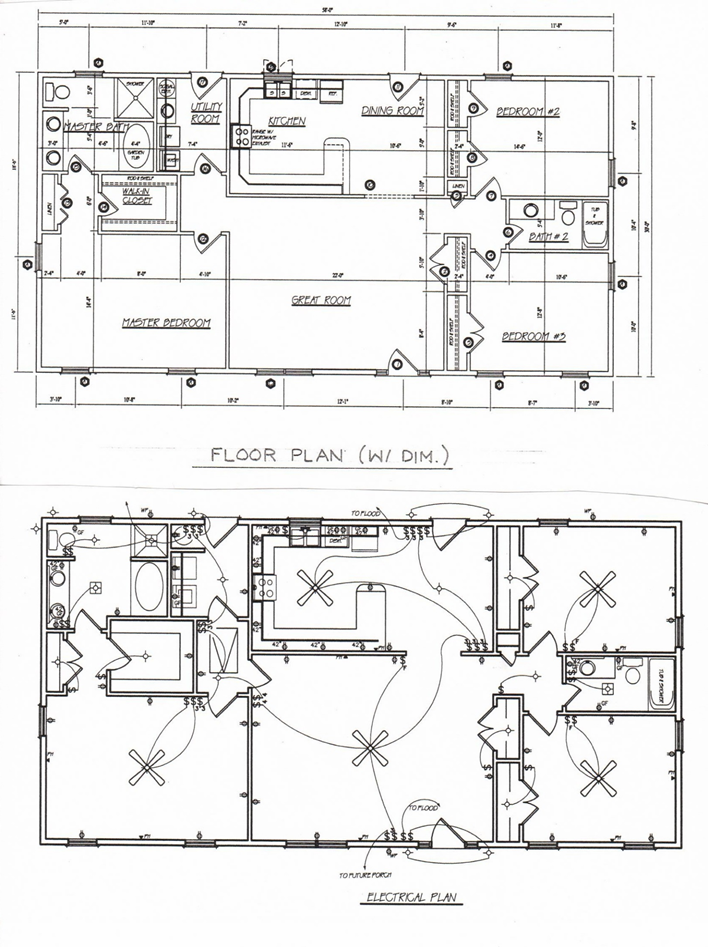
13. Do the closets have lights in them?

15. How many light sockets are on the outside of the house?

16. If the interior of the living room measures 22’ X 17’ 6", how many square feet are in the living room?

17. What do the dotted lines under the island in the kitchen represent?

18. Why do we need a separate floor plan from an electrical plan?



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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.03 | 4% | C2 | Understand the use of fasteners, hardware, and finishing materials in carpentry projects. |
| Sources of Information:  • *Agricultural Mechanics Fundamentals and Applications* – Unit 7 – Hand Tools, Fasteners, and Hardware  • *Agricultural Mechanics and Technology Systems* – Chapter 9 – Materials, Fasteners, and Hardware | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Types of Fasteners**

A. Nails are metal fasteners driven into the material it holds.

1. Common nails are used for general construction and have a flat head and diamond-shaped point.

2. Finishing nails have small heads that can be set below surface.

3. Brads are thin, short nails with small heads.

4. Cut nails are square on the ends and are used for tongue and groove board nailing.

5. Roofing nails used to fasten metal may have spiral grooves to prevent them from working loose.

6. Others – roofing, box, staple, duplex

B. Screws are fasteners with threads that bite into the material they fasten.

1. Kind based on material they hold – wood, sheet-metal, drywall, etc.

2. Kind based on metal they are made from – steel, brass, etc.

3. Kind based on shape of head – flat, round, oval, pan, etc.

4. Size is determined by diameter (gauge) and length (inches) of the shank.

5. A countersink is used to cut a “V” in the wood so that the top of the flathead screw will be flush or just below the wood surface.

C. Bolts are fasteners that require a threaded nut.

1. A lag bolt is sometimes called a lag screw because it has threads similar to a wood screw and does NOT use a nut. Often used with an expansion shield.

2. A carriage bolt has a round head over a square shank or shoulders.

3. A stove bolt may have either a round head or a flat head and the shank is threaded the entire length from bottom to top. Often used for lightweight metal structures.

4. A machine bolt has either a square head or a hex head and is threaded on the bottom for about 1". It is NOT threaded all the way to the top.

5. A cap screw is much like a machine bolt but has threads the entire length, is usually 2" or less in length, threads into something other than a nut, and may have different kind of head.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.03 | 4% | C2 | Understand the use of fasteners, hardware, and finishing materials in carpentry projects. |
| Activity Contributors:  • Michele Spence - Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 4.03**

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| **Activity Number** | **Activity** |
| **4.03.01** | **ID of Common Fasteners** – Students will make flash cards as described in 1.01 of the fasteners listed in 4.03 |
| **4.03.02** | **Use of Fasteners Matching** – Have students complete the matching. |

**4.03.02**

**Fasteners Matching**

DIRECTIONS – Match the fasteners with its use and/or description. A tool may be used more than once.

\_\_\_\_\_ General Construction a. Common Nail

\_\_\_\_\_ Square shank with a round head b. Cut Nail

\_\_\_\_\_ Used for tongue and groove board nailing c. Finishing Nail

\_\_\_\_\_ Small head for setting below surface d. Brads

\_\_\_\_\_ Threads into something other than a nut e. Lag Bolt/Screw

\_\_\_\_\_ Flat Head and diamond shaped point f. Carriage Bolt

\_\_\_\_\_ Thin, short nails with small heads g. Stove Bolt

\_\_\_\_\_ Square on the ends h. Machine Bolt

\_\_\_\_\_ Threads the entire length, <2" i. Cap Screw

\_\_\_\_\_ Threads similar to wood screw

\_\_\_\_\_ Round or flat head

\_\_\_\_\_ Threaded the entire length

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.04 | 5% | C2 | Understand framing terms to calculate and install floor, wall, and roofing materials. |
| Sources of Information:  • *Agricultural Mechanics Fundamentals and Applications* – Unit 40 – Planning and Constructing Agricultural Structures  • *Agricultural Mechanics and Technology Systems* – Chapter 16 – Framing Structures  • *Agricultural Mechanics and Technology Systems* – Chapter 17 – Finishing Structures | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Identify framing terms and materials**

A. Rafters, joists, sills, and studs are parts of the framing of a wood building.

B. Sills are large pieces of lumber that rest on the foundation of a building.

C. Joists are usually 2"x 6" or larger pieces of lumber. There are floor joists and ceiling

joists.

D. The sole plate is a horizontal framing piece of lumber that rests on top of the sub-floor. The top plate is on top of the studs.

E. Studs are vertical framing materials that connect to the sole plate on the bottom and the top plate at the top.

F. Rafters are the pieces of lumber at top that slant according to the pitch or slope of the

roof.

G. The incline or slant to a roof is the pitch or slope and may be shown as a % or as 4-12, 6-12, etc.

H. Most framing materials are 2" thick and 4", 6", 8", 10", or 12" wide. They form the skeleton or frame to support the building.

**Procedures used to calculate rafter lengths and angles**

A. A framing square has rafter tables and can be used to find the unit length and angles of rafters. A speed square can also be used to lay out a rafter.

B. Books and manuals have rafter tables, also.

C. If a rafter table is not available, the stepping method can be used to lay out a rafter.

D. To mark a plumb cut on a rafter, 12" is located on the framing square blade, and the rise number is located on the tongue. Example: for a 6-12 pitch, 6 is the rise number.

E. The unit length is from the top of the rafter to the edge of the wall. Total length includes unit length plus the tail or overhang of the rafter.

F. It is important that the layout of rafters be correct so that the roof will be even.

**Procedures used to cut and install framing materials**

A. In conventional or “stick built” buildings, the rafters and other roof framing are built on site.

B. Trusses are built off-site and erected so that the rafter, braces, and other roof framing are erected in one piece

C. Two methods of framing are platform and balloon. Most buildings use platform framing because the subfloor gives a platform to stand on while adding the framing parts above it.

D. Wall studs are nailed to the sole plate at the bottom and to the top plate at the top.

E. Metal anchors are used to strengthen the attachment of framing parts to each other so that toe nailing is reduced or eliminated. Toe nailing has a tendency to split lumber and is difficult to do because nails are driven at angles. Metal anchors used to connect rafters are called hurricane ties. Joist hangers are used to connect floor joists and to eliminate the need for ledgers which would have to be cut and installed to support the floor joists.

F. Short studs installed on each side of a door or a window are trimmer studs and need a header. Studs installed above and below a door or window are cripple studs.

G. The number on the blade of a framing square represents the run, and the number on the tongue represents the rise of a rafter.

H. Measuring, marking, cutting, and attaching framing materials should be done accurately so that the building will have the correct dimensions.

**Proper procedures to frame a wood building.**

A. Before construction begins; the builder should study the building plans.

B. When platform framing is used; a building is framed from the bottom to the top.

C. When balloon framing is used, there is no subfloor or platform to stand on. It is also

difficult to find lumber long enough to make studs for a two story building.

D. Most framing lumber is 2" thick.

E. Sills are the first part of the framing to be installed.

F. In platform framing, floor joists are attached to a header which is attached on top of sills.

G. In platform framing, the sole plate is attached on top of the subfloor which is attached to the top of the floor joists.

H. In platform framing, the wall studs are nailed to the top plate and the sole plate. The plates should be the same width as the studs.

I. In platform framing, the rafter is attached to the top plate.

J. If a warped board is used, the “crown” should be up.

K. Metal framing anchors such as hurricane ties are used to anchor rafters to the top plate and to keep wood from splitting from toe nailing.

L. Total rafter length includes the unit length plus the tail or overhang.

Example: Unit length is 110" plus overhang is 14" making a total rafter length of 124".

M. In a standard height building that uses pre-cut studs, the headers of standard size doors will usually need to be doubled 2" X 10" lumber.

N. Accuracy in measuring, marking, cutting, and fastening framing materials is necessary to construct a building that is square, plumb, and has the right dimensions.

O. Safety rules and procedures should always be followed.

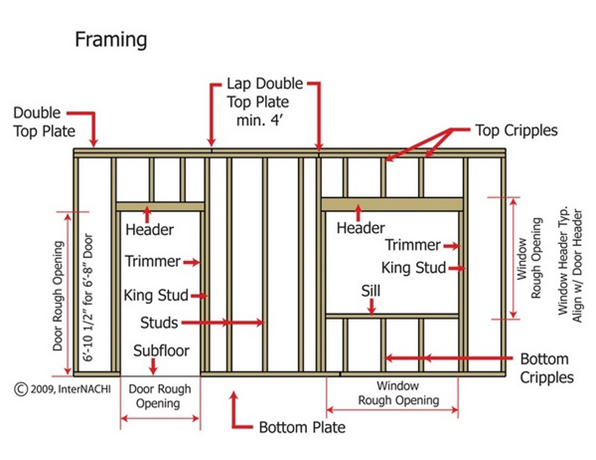
P. If the local building codes require permits, they should be obtained before construction begins.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.04 | 5% | C2 | Understand framing terms to calculate and install floor, wall, and roofing materials. |
| Activity Contributors:  • Michele Spence - Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 3.0**

|  |  |
| --- | --- |
| **Activity Number** | **Activity** |
| **4.04.01** | **Framing** – Students will cut and paste a model of a wall framing components. This will use color paper for each part that student will need to cut to correct length. Students should complete the activity as describe. The instructor should have various colors of paper available for them to use as needed. |
| **4.04.02** | **DVD’s –** There are several DVD’s from various sources that could be used as supplementary material for this unit. Some examples include:  Woodworkers Supply ([http://woodworker.com](http://woodworker.com/))  · Framing Roofs  · Framing Walls  · Framing Floors and Stairs |
| **4.04.03** | **NCFFA Agricultural Mechanics CDE Performance Skill 9 –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics. The scenario for this skill is:  *Construct a frame according to specified dimension using designated fasteners.* |

**4.04.01 Framing Assignment**



SCALE ¼” = 1’

**DIRECTIONS –** you are to construct the above diagram using colored paper for each part. **This is to be built to scale of ½” = 1’** using the measurements above.

This should be glued to a white sheet of paper. All of your needed materials (paper, glue, framing materials, etc) are located on the back table. Be sure to put these back in their proper place before you leave class.

Use these colors:

Green – studs

Yellow – header

Pink – plates

Blue – cripples

You should label each of the major pieces starred in the diagram above.

On your paper in the top right hand corner, write your name, Ag Mech 1 and today’s date.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.05 | 12% | C2 | Apply basics of layout and framing to construct and finish a shop project. |
| Sources of Information:  • *Agricultural Mechanics Fundamentals and Applications* – Unit 19 – Selecting, Planning and Building A Project  • *Agricultural Mechanics and Technology Systems* – Chapter 9 – Materials, Fasteners and Hardware  • *Agricultural Mechanics and Technology Systems* – Chapter 10 – Project Planning and Design  • *Agricultural Mechanics and Technology Systems* – Chapter 12 – Designing, Planning and Constructing Woodworking Projects | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Factors to consider when planning new construction or repair work**

A. Before starting new construction or repair jobs of any size, a plan, sketch, or drawing should be made to reduce costs, save time, improve quality of workmanship, and determine the need for the construction or repair project.

B. The best way to guarantee high quality materials and workmanship in construction projects is to include specifications in plans and contracts.

C. Time to be completed is a major consideration in planning agricultural construction or repairs because of the seasonal nature of farming.

D. The cost of a project is an important factor in planning construction

E. A bill of materials is an itemized list of materials and their costs.

**Grades of Lumber and Plywood**

A. Is it hardwood or softwood?

1. Hardwood comes from deciduous trees such as oak, birch, walnut, maple, and hickory.

2. Softwood comes from evergreen conifers such as pine, cedar, cypress, fir, and redwood.

B. Is it roughed or dressed?

1. Rough or nominal sized lumber is the actual size or full-dimension. A 2" x 4" is actually that size with rough surfaces.

2. Dressed or surfaced on all four sides lumber is smaller than rough lumber and is smooth. A dressed 2" x 4" is actually 1 ½" x 3 ½", and 1" thick boards are actually ¾" thick.

C. Is it select or common?

1. Select lumber is free of knots and blemishes, and select grades are A, B, C, and D.

2. Common lumber is general-purpose wood and may have knots and blemishes.

a. Grade No. 1 is a general-purpose wood that may have sound, smooth knots up to 2" in diameter.

b. Grade No. 2 is used for flooring and framing and has large knots and blemishes.

c. Grade No. 3 has loose knots or knotholes and is used for shelving and some types of framing.

d. Grades No. 4 and No. 5 are poor quality used for temporary structures.

D. Plywood is made by gluing odd numbers of veneers (layers) of wood to make 4' x 8' or 4' x 12' sheets of different thickness.

1. Hardwood or softwood outside layers.

2. Exterior has waterproof glue. Interior may or may not have waterproof glue.

3. Veneer grades

A – best, smooth, paintable, may have some neat repairs.

B – solid, some tight knots, splits and repairs.

C – tight knots up to 1 ½", knotholes up to 1". splits, discoloration, and defects.

D – knots and knotholes up to 2 ½", splits.

4. “AC” is exterior plywood with “A” face and “C” back.

5. “AD” is interior plywood with “A” face and “D” back.

E. OSB is Oriented Strand Board in the same sizes as plywood. It is made from strands, flakes, or wafers sliced from small diameter logs and bonded with exterior glue under heat and pressure. OSB is engineered so that the wood strands are oriented, not randomly placed like wafer board.

F. Particle board is manufactured sheets of wood made from ground up scrap wood, sawdust, and glue.

G. Shiplap is a board with a rabbet cut on each edge. A rabbet cut is a rectangle cut along the side or end of a piece of wood.

H. Tongue and grooved boards have a tongue or lip on one edge and a groove on the other edge so that the lip of one side fits into the groove on another board.

**Calculate the amount of materials needed for a construction project.**

A. Many building materials are sold by the square foot or in units that combine square footage such as a square or a sheet.

1. Square foot is 1 foot (12") by 1 foot (12") or 144 square inches.

2. Calculate number of square feet by multiplying length x width in feet. Example: 8 feet x 10 feet = 80 sq. ft.

3. A 4' x 8' sheet of plywood has 32 sq. ft.

4. A square of shingles has 100 sq. ft.

5. One story building costs can be estimated by using sq. ft. times cost per sq. ft. Example: 1000 sq. ft. x $10/sq. ft. = $10,000.

B. Board Feet

1. Board foot is a piece of lumber one inch thick, twelve inches wide, and one foot long.

2. Formula Note: Thickness and width are inches. Length is feet.

BF = T" x W" x L'

12

Example: How many board feet are in a board 1" thick, 12" wide and 10' long?

BF = 1 x 12 x 10 = 120 = 10

12 12

3. If there is more than one piece, multiply by number pieces of lumber of same size.

4. Most construction lumber is priced per thousand board feet.

M = 1000

Example: 10M BF – 10,000 Bd. Ft.

**Constructing a carpentry project**

A. Purpose of constructing a project in agricultural mechanics’ shop is to provide hands on learning or application of what has been learned in class.

B. The size and complexity of a project is its scope.

1. Beginning students should start with relatively small and simple projects such as nail boxes, tool boxes, and bird houses.

2. Advanced students should choose more challenging projects that use more skills such as storage buildings, trailers, and farm structures.

C. Projects that will be exposed to weather should be made from treated wood or should be painted with exterior paint to provide protection for the wood.

D. The width and thickness of wood needed for a project or for certain parts of a project depend on the use that will be made of the project. A work-bench or a livestock or horse barn requires larger sized wood than a bird house or nail box.

E. Projects made from both metal and wood should use bolts to fasten the wood to the metal.

F. Because of the nature of construction and the law of gravity, construction of a building starts at the bottom and continues to the top.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.05 | 12% | C2 | Apply basics of layout and framing to construct and finish a shop project. |
| Activity Contributors:  • Michele Spence - Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 4.05**

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| **Activity Number** | **Activity** |
| **4.05.01** | **Construction Measurement** – Students will use materials learned in 4.05 to calculate Board Feet and other construction measurements. |
| **4.05.02** | **Identification of Materials** – Students should be identify the types of materials listed in the notes. |
| **4.05.03** | **NCFFA Agricultural Mechanics CDE Performance Skill 7 –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics. The scenario for this skill is:  *Layout and cut a round hole according to specified blueprint using a jig saw.* |

**4.05.01 – Figure Board Feet and Construction Needs**

1. How many board feet are in 25 pcs of 2" x 4" x 192"?

2. How many squares of shingles are needed for a roof that measures 64’ x 80’?

3. How many pieces of plywood will be needed to cover a floor of a new house if the house measures 32’ x 64’?

4. How many board feet of lumber are in 18 pcs of 1" x 6" x 10’

5. How many square feet are in a house that measures 45’ x 75’?

6. If a house plan shows measurements of 46’ x 72’ and it cost $50 per square foot to build, how much should it cost to build this house?

7. How many squares of shingles will be needed to cover a house measuring 46’ x 72’?

8. How many board feet are in 75 pcs of 1" x 2" x 36"?

9. How many board feet are in 10 pcs of 2" x 12" x 72" & 6 pcs 1" x 10" x 16’?

10. How many board feet are in a stack of 6’ x 12’x 12’?

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.06 | 4% | C2 | Apply electrical principles to calculate the cost of electricity needed in the agricultural mechanics setting. |
| Sources of Information:  • *Agricultural Mechanics Fundamentals and Applications* – Unit 32 – Electrical Principles and Wiring Materials  • *Agricultural Mechanics and Technology Systems* – Chapter 20 – Electric Theory | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Principles of electricity**

A. Ampere is the rate of flow of electricity.

B. Volt is the measurement of electrical pressure.

C. Watt is the measurement of electrical power and is Volts X Amps.

D. Kilowatt is 1000 watts.

E. Circuit Breaker protects circuits from overload of current by tripping to break or open the circuit.

F. Fuse protects circuits from overload by melting a metal strip in the fuse.

G. Conductors are materials such as copper, aluminum, or water that will carry or conduct electricity.

H. Insulators are materials such as rubber and plastics that will not conduct electricity.

I. Hot wire is a current-carrying conductor under electrical pressure.

J. Neutral wire is a current-carrying conductor not under electrical pressure (has volts).

K. Ground wire is a conducting wire that transmits current to the earth to minimize the danger of electrical shock.

L. Ohms is a measure of the resistance to the flow of electricity.

**Compute electrical energy and cost**

A. Watts equal volts multiplied by amps. W=V x A

How many watts of electricity will a 7.5 amperes electric motor use in ~~5 hours on~~ a 120 volt circuit?

W = 120 x 7.5 ~~x 5 W~~ = 900

B. Volts equal watts divided by amps. V = W

A

What volt circuit is needed for a 7.5 amp electric motor that uses 900 watts in one hour?

V = 900

7.5

V = 120

C. Amps equal watts divided by volts. A = W

V

What should the amp rating of an electric motor be if it uses 900 watts of electricity in one hour in a 120 volt circuit?

A = 900

120 A = 7.5

D. Ohms Law E = I x R or I = E/R or R = E/I (E = Volts) (I = Amperes) ( R = Resistance)

E. Cost of electricity = cost per kilowatt x number of kilowatts x hours of use

Note: kilowatt is 1000 watts

If electricity costs 12¢ per kilowatt-hour, how much would it cost to use 2 kilowatts per hour for 10 hours? 2 kw x 10 hrs. = 20 kwh

$.12 x 20 kwh = $2.40

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.06 | 4% | C2 | Apply electrical principles to calculate the cost of electricity needed in the agricultural mechanics setting. |
| Activity Contributors:  · Michele Spence - Agriculture Education Instructor Emeritus  · Michael Hayward Bowden – Agriculture Education Instructor – Fuquay-Varina HS | | | | |

**Suggested Activities 4.06**

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| --- | --- |
| **Activity Number** | **Activity** |
| **4.06.01** | **Electrical Measurements** – Students will complete the worksheet on calculating electrical measurements. |
| **4.06.02** | **Electrical Terms** – Students will complete the worksheet matching the terms and the words. |
| **4.06.03** | **Electrical Unit Group Exercise –** Students will follow the directions to write a story using the concepts learned in the electrical wiring unit. |

**4.06.01**

**Electrical Measurements**

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| --- | --- |
| 1. | What is the amperage rating of an electrical device that uses 12 kilowatts of electricity when operated for 6 hours in a 120-volt circuit? Formula is A = W/V |

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| 2. | How many watts will be used in 16 hours if an electric motor requires 5.5 amperes of electricity, and is on a 120 volt electrical circuit 10 hours? Formula W = V x A |

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| 3. | An agricultural mechanics shop has five 120 watt lights, a 700-watt saw and a 120-watt fan that were used for 6 hours. How many KILOWATTS of electricity were used? |

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| 4. | What is the amperage of a circuit with ten 100 watt light bulbs in a 120-volt circuit? Formula: A = W/V |

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| 5. | If electricity costs $0.12 per kilowatt hour, how much does it cost to operate a router which requires 12 amperes of electricity and is used in a 120 volt electrical circuit for 4 hours? Formula is W = V x A |

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| 6. | If the local rate for electricity is $.11 per kilowatt hour, how much should the electric bill be for 240 kilowatt hours? |

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| 7. | If the local rate for electricity is $0.07 per kilowatt hour, how much does it cost to operate an electric motor requiring 25 amperes of electricity if used in a 120 volt circuit for one hour? W=VxA |

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| 8. | What is the watt rating of a portable electric drill with 40 amps and 120 volts? W = V x A |

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| 9. | How many watts of current does an electric motor which requires 10 amperes of electricity and is designed to be used in a 120 volt electrical circuit use in one hour? W = V x A |

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| 10. | | How many kilowatts of current does a portable saw that requires 12 amperes of electricity and is designed to be used in a 120-volt electrical circuit use in one hour? W = V x A |
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**4.06.02**

**Electrical Terms**

\_\_\_\_\_ Ampere a. conducting wire that transmits current to the earth

\_\_\_\_\_ Volt b. protects circuits from overload of current by tripping

\_\_\_\_\_ Watt c. materials such as copper that will conduct electricity.

\_\_\_\_\_ Kilowatt d. measurement of electrical power

\_\_\_\_\_ Circuit Breaker e. current-carrying conductor under electrical pressure.

\_\_\_\_\_ Fuse f. 1000 watts

\_\_\_\_\_ Conductors g. materials such as plastics that will not conduct electricity

\_\_\_\_\_ Insulators h. rate of flow of electricity

\_\_\_\_\_ Hot Wire i. protects circuits from overload by melting a metal strip

\_\_\_\_\_ Neutral Wire j. measurement of electrical pressure.

\_\_\_\_\_ Ground Wire k. current-carrying conductor not under electrical pressure

**4.06.03**

**Electrical Unit Group Exercise**

DIRECTIONS: Your group (three people) are to create a short story to tell me about concepts taught in the electrical wiring unit. For this assignment, you should:

• Use electrical terms, and materials as characters in your story.

• The story should use complete sentences

• It should be 1-2 paragraphs long

• Be creative

• As an option, if your group does not like to write, then the group can draw this into a comic strip

• Keep it Clean, no pornographic stories, regardless of the fact we use “strippers”.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.07 | 7% | C2 | Apply principles of electrical wiring to install branch circuits in a safe manner. |
| Sources of Information:  • *Agricultural Mechanics Fundamentals and Applications* – Unit 32 – Electrical Principles and Wiring Materials  • *Agricultural Mechanics Fundamentals and Applications* – Unit 33 – Installing Branch Circuits  • *Agricultural Mechanics and Technology Systems* – Chapter 21 – Wiring AC Circuits | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Safe Practices Involving Electricity**

A. Organizations

1. National Fire Protection Association (NFPA) promotes and improves the science and methods of fire protection and publishes the National Electric Code (NEC).

2. Underwriter Laboratories (UL) tests all types of wiring materials and electrical devices for safety.

B. Safety Precautions

1. Wear boots or shoes with rubber heels to insulate against shock.

2. Wear clothing made of materials low in flammability to prevent fires.

3. Ground all outlets, switches, service entrances, etc. to prevent shock.

4. Extension cords should not be used under carpet because of fire danger.

5. Standing in water or damp places or touching switches or receptacles with wet hands may cause electrical shock because water conducts electricity.

6. Do not touch someone undergoing electrical shock because both people will become part of circuit, and both will be shocked.

7. Always turn circuit breakers to the “off” position before beginning work.

8. Use correct size fuses and circuit breakers to prevent fires.

9. Use only double insulated portable tools or those with three-wire grounded cords to prevent shock.

10. The two deadliest hazards associated with electricity are shock and fire and common sense should be used to prevent conditions that will cause either.

**Materials used in electric wiring**

A. Wire

1. Size is measured by gauge. The smaller the gauge number, the larger the wire.

2. Kinds of wire include solid or stranded and copper or aluminum. Copper is one of the best conductors of electricity. Aluminum wire has to be one size larger than copper to carry the same amount of current.

3. Definitions

a. Conductor is a material that allows electricity to move readily and offers low

resistance. Examples: copper, aluminum, and water.

b. Insulator is a material that is a poor conductor of electricity. Examples: rubber and Plastic

c. Hot wire is usually black or red.

d. Neutral wire is usually white.

e. Ground wire is usually bare (no insulation) or green.

4. Types of wire include indoor and outdoor.

a. Indoor types

1. T is thermoplastic used for dry locations indoors.

2. TW is moisture resistant thermoplastic for indoor dry or wet areas.

3. RHW is rubber and is heat and moisture resistance and is used for

large appliances or service entrance in both wet and dry locations.

4. Others include THHN, THW/THWN, RH, and XHHW.

b. Outdoor types

1. UF is underground feeder wire used for underground service and can

be buried directly in soil, but not in concrete.

2. USE is underground service entrance that has to have mechanical

protection (conduit) where wires enter and leave the ground.

3. SE/SEU is unarmored service entrance cables used to bring service

into the building.

4. ASE is armored service entrance used to bring service into a building.

c. Non-metallic sheathed cable commonly called Romex™ has copper wire

covered with paper and vinyl for insulation. Most wiring used in residential

construction is Romex™.

B. Conduit provides mechanical protection for wires and may be flexible or non-flexible and metal or plastic depending on NEC Code requirements.

C. Outlet, junction, and switch boxes are electrical boxes used anywhere wires are spliced or connected to a switch, light, receptacle, etc.

D. Receptacles

1. A duplex receptacle has places or holes to receive two plugs.

2. A 15a-240v receptacle has holes to receive one plug.

3. Dryer and range receptacles are 240v with holes to receive specific shaped plugs.

4. Porcelain receptacles for lights may have only a place for a bulb, or they may include a chain for a switch, or they may also include an outlet for a plug.

E. Switches are used to stop and start the flow of electricity.

1. A single pole switch has two terminals and controls lights from one location.

2. A three-way switch has three terminals and controls lights from two locations.

3. A four-way switch has four terminals and is used in combination with three-way switches to control lights from three or more locations.

F. Blank covers are used to cover junction boxes.

G. Wall plates are used to cover switch and receptacle boxes.

H. Connectors

1. Cable connectors and split bolt connectors are used to fit knockouts in boxes and to connect outside wires to entrance wires.

2. Solderless wire connectors are used to turn wires to make a pigtail splice and to insulate the connection or splice in one operation.

3. Others include ground clamps, screws and clips, entrance elbow and caps or weather heads, and insulators.

J. A meter is used to measure the amount of electricity used.

K. A circuit breaker is a switching device that automatically opens the circuit when too much current passes through it.

L. A fuse has a strip of metal in it that melts when too much current passes through it.

**Installation Procedures**

A. Types of single pole switches to install include toggle, rocker arm, push button, and silent depending on use and location.

B. A light fixture uses two terminals. A single pole switch has two terminals.

C. A three-way switch has three terminals and uses two traveler wires – one red and one black.

D. A four-way switch has four terminals and can only be installed in between two three-way switches. It has four traveler wires.

E. Electrical or wiring boxes must be installed at every junction, splice, light, switch or outlet.

F. Certain NEC codes require wires to be inside conduit. Thin conduit may be cut with a hack saw or a metal cutting saw.

G. NM cable is installed inside buildings.

H. Outdoor wire is selected based on use. UF is used to bury underground as feeder wire. USE is used to provide mechanical protection where wires enter and leave the ground (soil). SE and SEU are used to bring electrical service into a building. TW is used to provide service in areas that have moisture.

I. The wire loop should be attached to a screw terminal in the same direction the screw turns.

J. A rat tail splice is used inside junction boxes. A Western Union splice is used where strength of the splice is required.

K. Copper wire is preferred, but if aluminum wire is used, one size larger wire must be used to carry the same electrical current. Example: go from size 10 to size 8. Remember: smaller number, larger wire.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.07 | 7% | C2 | Apply principles of electrical wiring to install branch circuits in a safe manner. |
| Activity Contributors:  • Michele Spence - Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 4.07**

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| **Activity Number** | **Activity** |
| **4.07.01** | **Wiring Plan** – Using color pencils draw in the wires to connect the lights, outlets and switches to the power source. |
| **4.07.02** | **Wiring Switches and Outlets** – Using standard NM cable, wire a switch, outlet and other items provided by your instructor. |
| **4.07.03** | **NCFFA Agricultural Mechanics CDE Performance Skill 12 –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics. The scenario for this skill is:  *Wire a light fixture controlled by a single-pole switch in the middle of a run with power being first supplied to the light fixture. The student will include a duplex receptacle beyond the light fixture which is to remain hot at all times.* |
| **4.07.04** | **NCFFA Agricultural Mechanics CDE Performance Skill 13 –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics. The scenario for this skill is:  *Wire a light fixture controlled by a single-pole switch with power being first supplied to the single-pole switch. The student will include a duplex receptacle beyond the light fixture which is to remain hot at all times.* |
| **4.07.05** | **NCFFA Agricultural Mechanics CDE Performance Skill 14 –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics. The scenario for this skill is:  *Agricultural Mechanics Performance Skill 14 Wire a light fixture controlled by three-way switches when the power is first supplied to one of the switches and with the light located between the switches.* |
| **4.07.06** | **NCFFA Agricultural Mechanics CDE Performance Skill 15 –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics. The scenario for this skill is:  *Wire a light fixture controlled by three-way switches when the power is first supplied to the light fixture.* |
| **4.07.07** | **NCFFA Agricultural Mechanics CDE Performance Skill 16 –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics. The scenario for this skill is:  *Wire a GFCI receptacle with single-location protection*. |
| **4.07.08** | **NCFFA Agricultural Mechanics CDE Performance Skill 17 –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics. The scenario for this skill is:  *Wire a GFCI receptacle with multiple-location protection for a single-pole switch controlling a light downline* |

**4.07.01 –** Wiring Plan

**DIRECTIONS:** Using the following diagram, wire the light fixture, switch and duplex receptacle.

You are to use the following colors/symbols for the wires and materials and assume you have a 3 wire cable:

· Hot – Red or Black

· Neutral – White

· Ground – Yellow or Green (Bare)

· Connectors - C

POWER SOURCE





OUTLET MUST BE HOT AT

ALL TIMES

|  |  |  |  |  |
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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics |
| **OBJECTIVE:** | 4.08 | 4% | C2 | Apply principles of painting and preserving to finish wood and metal projects. |
| Sources of Information:  • *Agricultural Mechanics Fundamentals and Applications* – Unit 27 – Preparing Wood and Metal for Painting  • *Agricultural Mechanics Fundamentals and Applications* – Unit 28 – Selecting and Applying Painting Materials  • *Agricultural Mechanics and Technology Systems* – Chapter 12 – Designing, Planning and Construction Wood Working Projects | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Paints and Preservatives**

A. Wood, steel and concrete are the primary materials used to construct agricultural buildings and equipment. These materials should be protected and waterproofed.

B. Preservatives are chemical liquids applied by hand that kill wood rotting fungus and wood eating insects.

C. Paint is a substance consisting of pigment suspended in a liquid known as a vehicle. A pigment is a solid coloring substance and is carried by the vehicle. As the vehicle evaporates the paint is said to be drying.

D. Paint with a gloss or semi-gloss is referred to as enamel. Gloss means shiny and paint with a slight shine is called semi-gloss.

E. Paints with a water based vehicle are called water based paints or latex.

F. Paints with an oil based vehicle are called oil based paints or alkyd.

G. Interior paints will not hold up if exposed to weather and exterior paints are designed to withstand moisture and the outside weather conditions. Both water and oil based may be formulated for interior or exterior use.

H. Primers and undercoaters are used to prepare surfaces for painting and must be compatible with the top coats. (Oil based primer/undercoats must be top coated with oil based paints and vise versa)

I. Paints can be applied by brushes, rollers, aerosols and spray equipment. Painting by brush takes longer. Painting by spray equipment is faster and cover more area faster but equipment is expensive.

J. Latex paint can be applied with brushes made of bristles from synthetic fibers and oil based paints should be applied with natural bristle brushes.

K. Roller pads are selected based on the type of surface being painted and the nap or length of the soft, woolly, thread-like surface of the roller.

**Surface Preparation and Paint Application**

A. Surface preparation to remove dust, oil, moisture and other loose material from the surface should be done before painting.

B. Cracks and holes should be repaired or caulked.

C. Moisture in or on the wood will cause paint to blister and peel.

D. Expanding and contracting surfaces cause the paint to crack and scald.

E. Dust on the surface or in the paint causes specks and rough places on the painted surface.

F. The quality of a paint job is strongly affected by the quality of the surface preparation before painting. If spray painting the paint must often be thinned.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
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| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.08 | 4% | C2 | Apply principles of painting and preserving to finish wood and metal projects. |
| Activity Contributors:  • Michele Spence - Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 4.08**

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| **Activity Number** | **Activity** |
| **4.08.01** | **Painting Practice** – Student should prepare a wood or metal surface, select the proper paint for the project and paint the surface |
| **4.08.02** | **DVD’s –** There are several DVD’s from various sources that could be used as supplementary material for this unit. Some examples include:  Woodworkers Supply ([http://woodworker.com](http://woodworker.com/))  · Wood Finishing Basics  Modern Marvels  · Paint |

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
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| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.09 | 4% | C2 | Understand principles and materials for constructing fences using various materials. |
| Sources of Information:  • *Agricultural Mechanics Fundamentals and Applications* – Unit 42 – Fence Design and Construction  • *Agricultural Mechanics and Technology Systems* – Chapter 19 – Fencing and Livestock Structures | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Principles and Procedures for Constructing Fences**

A. Fences should be selected based on the purpose for which they will be used. Some are for looks, privacy, security, keeping animals, etc.

B. Fences may be constructed of wood, masonry materials, wire, plastic/vinyl, and other materials.

C. Wood fences should be treated wood or wood types that will withstand outdoor conditions. Treated wood will usually last longer than most types of untreated wood.

D. Corner posts and gate posts should be larger than line posts. Fence boards should be placed so that the joints on the posts are staggered. (Do not join all on the same post.)

E. Electric wire fences may be temporary or permanent. High tensile wire fences can be stretched tighter than barb wire and have less potential for causing harm to livestock.

F. Fences around barns and homes are usually made of wood boards.

G. The type fence used for both large and small farm animals is woven wire fence.

H. Barbed wire fence is usually used for larger animals such as cattle.

I. Chain-link fences are used for security and are attractive and stronger but more expensive.

J. Fence posts should be solid in the ground before fences are attached. Good bracing is necessary in corners and at the ends of fences.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit C** | **Construction Principles** |
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| **ESSENTIAL**  **STANDARD:** | 4.00 | 48% | C2 | Apply construction principles in agricultural mechanics. |
| **OBJECTIVE:** | 4.09 | 4% | C2 | Understand principles and materials for constructing fences using various materials. |
| Activity Contributors:  • Michele Spence - Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 4.09**

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| **Activity Number** | **Activity** |
| **4.09.01** | **Fencing Assignment** – Using the internet, gather information and have the students develop a plan for a fence. |
| **4.09.02** | **Constructing A Fence** – Instructors will provide students with materials and instruction needed to construct a fence demonstrating the location of holes, leveling the posts and attaching the various parts of te fence. |

**4.09.01**

**Fencing Assignment**

**Part 1** – Using [www.lowes.com](http://www.lowes.com/), gather information on the following fencing materials.

|  |  |  |
| --- | --- | --- |
| ***Fencing Material*** | ***Price*** | ***Description*** |
| Dog Ear Panel 6’ x 8’ |  |  |
| Gothic Picket Panel 3’ x 8’ |  |  |
| Spilt Rail Fence Line 6"x3"x5’ |  |  |
| Pine Fence 4"x 11’ |  |  |
| Gatehouse Picket Vinyl 3’x8’ |  |  |
| Gatehouse Picket Vinyl 6’x8’ |  |  |
| Gatehouse Vinyl Post 5"x5" |  |  |
| Gatehouse Vinyl Line |  |  |
| Barrette 2"x 6" x 8" Rail |  |  |
|  |  |  |

**Part 2** – On a separate sheet of paper, research the pieces that you will need to complete a panel fence, a picket fence and a rail fence in both wood and vinyl. Write these down so you can refer back to it quickly.

**Part 3** – Using the information you have gathered, develop a plan for constructing a fence for one of the following scenarios:

· A 100’ x 80’ vegetable garden

· A backyard that measures 250’ x 325’

· A playground that measures 1250’ x 2500’

· A decorative border for a front yard that measures 5250’ long with sides of 1750’

You should provide for all pieces need and list these. In addition, you should develop a final cost for the entire project.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit D** | **Construction Principles** |
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| **ESSENTIAL**  **STANDARD:** | 5.00 | 20% | C2 | Apply principles of welding in the agricultural mechanics shop. |
| **OBJECTIVE:** | 5.01 | 8% | C2 | Understand principles for using arc welding equipment and materials for SMAW, GMAW and GTAW. |
| Sources of Information:  · *Agricultural Mechanics: Fundamental & Applications* – Unit 25 – Selecting and Using Arc Welding Equipment  · *Agricultural Mechanics: Fundamental & Applications* – Unit 26 – Arc Welding Mild Steel  · *Agricultural Mechanics and Technology Systems* – Chapter 29 – Shielded Metal Arc Welding | | | | |

***Note to teacher: Create guided notes, PowerPoint’s, or visual presentations for unpacked content.***

**Compare types of arc welding machines, welding equipment, and electrodes.**

**A.** **Welding Defined**

1. Electric arc welding is a process where two pieces of metal are joined together by melting and joining the edges of each using an electrode to help fill the space between them.

**B.** **Types of Welding Machines**

1. AC (alternating current) used for most agricultural arc welding jobs and has low purchase cost compared to other arc welders.

2. DC (direct current) are generator operated and can be used where regular electrical power is not available.

3. AC/DC welders use a rectifier to change regular AC current to DC. These welders can be used as either AC or DC.

4. TIG (tungsten inert gas) welders have an electric power unit, a pressure reducing regulator, electrode holder, tungsten electrode, nozzle, cables and hoses, and a gas supply unit.

1. TIG is best for welding stainless steel and aluminum because it is stronger and freer of corrosion than other welders.
2. The two gases used are helium and argon.
3. The tungsten electrode is not consumed (burned) and there is no slag on the bead.

5. MIG (metallic inert gas) welders are wire feed welders that use a consumable wire fed automatically through the torch.

a. MIG welding is best for welding very thin metals.

b. MIG welding can be used in industries as an automatic welder.

**C.** **Welding Equipment**

1. Safety equipment include a welding helmet, safety glasses, leather gloves, leather aprons, leather welding jacket, and leather boots.
   1. A shade 10 lens in a welding helmet protects the eyes of the person welding or the person watching someone weld from being burned from the ultraviolet and infrared light rays from welding.
   2. Most items are used to protect clothing and the body from burns.
   3. Safety glasses are also needed to protect the eyes during chipping and cleaning welds.

2. A chipping hammer is used to remove slag or the protective covering deposited when stick welding off a welded bead.

3. A wire brush is used to remove rust and dirt from metal and remaining slag from a welded bead.

4. Clamps and vise grip clamps are used to hold metal in place for welding.

**D. Electrodes**

1. Electrodes are wire cores or rods usually covered in flux.

2. Size is the diameter of the metal rod not including flux.

3. Classification code system has a letter and four numbers such as E6011 or

E6013.

4. E6011 is the most commonly used electrode for welding for welding farm projects

because it can be used for all-purpose welding of mild steel, has deep

penetration, and can be used with both AC and DC welders.

5. E6013 is a good general-purpose electrode but only has medium penetration.

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| **COURSE:** | **Agricultural Mechanics I** | | **Unit D** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 5.00 | 20% | C2 | Apply principles of welding in the agricultural mechanics shop. |
| **OBJECTIVE:** | 5.01 | 8% | C2 | Understand principles for using arc welding equipment and materials for SMAW, GMAW and GTAW. |
| Activity Contributors:  • Michele Spence - Agriculture Education Instructor Emeritus | | | | |

**Suggested Activities 5.01**

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| **Activity Number** | **Activity** |
| 5.01.01 | **What’s In a Number** – Students are to research the meaning behind the numbers located on an electrode. |
| 5.01.02 | **Welder Types Foldable** – The student will fold a sheet of plain paper into three columns. Then using the provided example, will research and develop a foldable on welder types. |
| 5.01.02 | **Welding Personal Protective Equipment –** Students will draw and label a welder using the correct PPE, including the right shade of lens for SMAW, MIG and TIG. |

**5.01.01 What’s In A Number**

1. Label the parts of the electrode number below.

E 6 0 1 1

2. Fill in the chart of the meaning of the following numbers for the Welding Position.

|  |  |
| --- | --- |
| Position | Welding Position |
| E \_ \_ 1 \_ |  |
| E \_ \_ 2 \_ |  |
| E \_ \_ 3 \_ |  |

3. Fill in the chart of the Type of Welding.

|  |  |
| --- | --- |
| Welding Position | Type of Welding |
| E \_ \_ \_ 0 |  |
| E \_ \_ \_ 1 |  |
| E \_ \_ \_ 2 |  |
| E \_ \_ \_ 3 |  |
| E \_ \_ \_ 4 |  |
| E \_ \_ \_ 5 |  |
| E \_ \_ \_ 6 |  |
| E \_ \_ \_ 7 |  |
| E \_ \_ \_ 8 |  |

**5.01.02**

**Welding Foldable**

|  |  |
| --- | --- |
| *Outside* | *Inside* |
| TIG  Description  Advantages  Disadvantages  Average Cost | AC Welders  Description  Advantages  Disadvantages  Average Cost |
| MIG  Description  Advantages  Disadvantages  Average Cost | DC Welders  Description  Advantages  Disadvantages  Average Cost |
| Cover          Name  Class  Date | AC/DC Welders  Description  Advantages  Disadvantages  Average Cost |

**5.01.03**

**Welding Personal Protective Equipment (PPE)**

Directions: In the space below draw a welder dressed for proper use while welding. Be sure to include proper clothing to be worn under protective outer layers. For the helmet, be sure to give the correct shade of lens to have for SMAW, MIG and TIG.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit D** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 5.00 | 20% | C2 | Apply principles of welding in the agricultural mechanics shop |
| **OBJECTIVE:** | 5.02 | 12% | C2 | Apply welding skills to construct agricultural mechanics projects. |
| Sources of Information:  · *Agricultural Mechanics: Fundamental & Applications* – Unit 25 – Selecting and Using Arc Welding Equipment  · *Agricultural Mechanics: Fundamental & Applications* – Unit 26 – Arc Welding Mild Steel  · *Agricultural Mechanics and Technology Systems* – Chapter 29 – Shielded Metal Arc Welding | | | | |

***Note to teacher: Create guided notes, PowerPoint’s or visual presentation for unpacked content.***

**Basic arc welding procedures**

A. Before metal is welded, it should be identified and cut to correct size (if needed).

B. Metal should be cleaned before it is welded. A grinder is the fastest way, but a wire brush or other methods may be used to remove paint, rust, dirt, oil, etc.

C. Metal more than ¼" thick should be beveled at a 30 degree angle and placed 1/16" to 1/8" apart before two pieces are welded together.

1. The maximum thickness of the beveled edge of metal should be the same as the diameter of the electrode used to make the weld.

2. A 1/8" electrode for a 1/18" thick bevel.

D. Tapping or scratching methods can be used to strike an arc (starts a weld).

1. If an electrode sticks to the metal, the electrode should be wiggled back

and forth, or it should be released from the electrode holder.

2. Arc length should be the same as the diameter of electrode.

E. Many different electrode movements or weaves are used to make a bead.

1. Regardless of the movement used, the pattern should be uniform to make

a strong weld.

2. Travel speed must be constant to provide a consistent bead.

F. Welding position, metal thickness, and electrode size are used to determine amperage setting.

1. A high narrow bead with poor penetration is the result if amperage is too low.

2. A flat bead with excessive spatter is caused by amperage that is too high.

3. Correct amperage helps make a uniform bead with bead width and penetration depth equal to each other.

**Types of Weld Joints**

1. Butt – two pieces of metal lying in the same plane such as end-to-end or edge-to-edge in flat position.

2. T or “T” two pieces of metal placed together to form a T or a ⊥ or ┤, two pieces at a 90° angle to each other. A fillet weld is used to fuse the two pieces permanently.

3. Lap – two pieces of metal overlap each other.

4. Corner – two pieces of metal make a 90° corner.

5. Edge – two pieces placed parallel to one another or stacked on top of each other.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COURSE:** | **Agricultural Mechanics I** | | **Unit D** | **Construction Principles** |
|  | | | | |
| **ESSENTIAL**  **STANDARD:** | 5.00 | 20% | C2 | Apply principles of welding in the agricultural mechanics shop |
| **OBJECTIVE:** | 5.02 | 12% | C2 | Apply welding skills to construct agricultural mechanics projects. |
| Activity Contributors:  · Michele Spence - Agriculture Education Instructor Emeritus  · Michael Hayward Bowden – Agriculture Education Instructor – Fuquay-Varina HS | | | | |

**Suggested Activities 5.02**

|  |  |
| --- | --- |
| **Activity Number** | **Activity** |
| **5.02.01** | **Types of Welds** – Students will research the various types of welds and complete a foldable on these |
| **5.02.02** | **Welding Problem Solving** – Using the notes and text, determine what to do in these situations. |
| **5.02.03** | **NCFFA Agricultural Mechanics CDE Performance Skill 1P –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics CDE. The scenario for this skill is:  Make a Butt Joint Weld in the Flat Position |
| **5.02.04** | **NCFFA Agricultural Mechanics CDE Performance Skill 1.1P –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics CDE. The scenario for this skill is:  Make a Butt Joint Weld in the Flat Position (length to be determined by Event Official) |
| **5.02.05** | **NCFFA Agricultural Mechanics CDE Performance Skill 1.2P –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics CDE. The scenario for this skill is:  Make a T fillet Weld in the Flat Position |
| **5.02.06** | **NCFFA Agricultural Mechanics CDE Performance Skill 1.3P –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics CDE. The scenario for this skill is:  Make a T fillet Weld in the Horizontal Position |
| **5.02.07** | **NCFFA Agricultural Mechanics CDE Performance Skill 1.4P –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics CDE. The scenario for this skill is:  Make an Outside Corner Joint Weld |
| **5.02.08** | **NCFFA Agricultural Mechanics CDE Performance Skill 1.5P –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics CDE. The scenario for this skill is:  Make a Vertical Up Butt Joint Weld |
| **5.02.09** | **NCFFA Agricultural Mechanics CDE Performance Skill 1.6P –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics CDE. The scenario for this skill is:  Make a Lap Joint Fillet Weld in the Flat Position |
| **5.02.10** | **NCFFA Agricultural Mechanics CDE Performance Skill 1.7P –** Students will use the scenario and instructors will use the Judges Grading Rubric found at [https://ncffa.org](https://ncffa.org/) under Resources: Chapter Guide to State Activities: Agricultural Mechanics CDE. The scenario for this skill is:  Make an Open Root Butt Joint Weld in the Flat Position |
| **5.02.11** | **SMAW Welding Grading Rubric –** Instructors can use this grading rubric to measure students at the beginning and throughout the welding process. Use the illustrations in the textbook to explain to students what instructor is looking for. |
| **5.02.12** | **Welding Reflection –** Instructors will have students reflect on their welding and how it has changed |

**5.02.01**

**Types of Welds**

|  |  |
| --- | --- |
| *Outside* | *Inside* |
| Corner    Draw the Weld    Describe how to perform the weld    Special Issues | Butt    Draw the Weld    Describe how to perform the weld    Special Issues |
| Edge    Draw the Weld    Describe how to perform the weld    Special Issues | T    Draw the Weld    Describe how to perform the weld    Special Issues |
| Cover          Name  Class  Date | Lap    Draw the Weld    Describe how to perform the weld    Special Issues |

**5.02.02 – Welding Problem Solving**

DIRECTIONS: Using your notes, texts, and internet, research the causes of the following issues and how to correct them

|  |  |
| --- | --- |
| ***Problem*** | ***Solution*** |
| High, narrow bead |  |
| Even spaced semi-circles |  |
|  |  |
| Difficulty keeping a bead running |  |
| Splatter around weld |  |
|  |  |
| Puddle burns through plate |  |
| Sounds like bacon frying |  |
|  |  |
| Electrode sticking to the metal |  |
| Arc noisy |  |
|  |  |
| Bead flat |  |

**5.02.02**

**Welding Problem Solving - KEY**

DIRECTIONS: Using your notes, text and internet, research the causes of the following issues and how to correct them

REFERENCE – *Agricultural Mechanics: Fundamental & Applications* – Unit 26 – Arc Welding Mild Steel

|  |  |
| --- | --- |
| ***Problem*** | ***Solution*** |
| High, narrow bead | Ampere too low |
| Even spaced semi-circles | Correct weld |
|  | Arc length too long |
| Difficulty keeping a bead running | Ampere too low |
| Splatter around weld | Ampere too high |
|  | Proper current, speed, length |
| Puddle burns through plate | Ampere too high |
| Sounds like bacon frying | Ampere correct |
|  | Travel speed too fast |
| Electrode sticking to the metal | Ampere too low |
| Arc noisy | Ampere too high |
|  | Current too high |
| Bead flat | Ampere too high |

**5.02.11 SMAW Weld Bead Quality Assessment**

*Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class \_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_*

*Rod Number \_\_\_\_\_\_\_\_\_\_ Diameter of Rod \_\_\_\_\_\_\_\_ Metal Thickness \_\_\_\_*

**Remember CLAMS**

C—Current; L—Length of Arc; A—Angle of rod; Manipulation of puddle;

S—Speed of travel.

***Scoring***

Proper Safety Equipment Used YES NO

Metal prepared properly before weld YES NO

Welder adjusted to proper amperage for material

thickness, rod type, and diameter. YES NO

List Amperage Setting for Your Machine \_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| *Grading For* | *Possible* | *Awarded* |
| Proper Amperage Setting | 9 points |  |
| Correct Arc Length | 10 points |  |
| Proper Rod Angle | 8 points |  |
| Proper Penetration into Material Welded | 13 points |  |
| Correct Puddle Manipulation | 10 points |  |
| Proper Travel Speed | 10 points |  |
| Weld is Correct Width | 10 points |  |
| Uniformity of Weld | 10 points |  |
| Weld Adequately Cleaned | 12 points |  |
| Overall Appearance of Weld | 8 points |  |
| **TOTAL POINTS** |  |  |

Comments\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**5.02.12**

**Welding Reflection**

You have been practicing your welding skills for the last 3 class periods. You have been burning welding rods and are beginning to run weld beads. At the beginning of each class we have reviewed welding techniques to improve your skill level. It is now time to reflect upon what you have learned and the progress you have made over the last 3 days. Write a 5-7 sentence reflective paragraph, using complete sentences, with proper punctuation and spelling. Write the paragraph in the space provided below