

Name _____

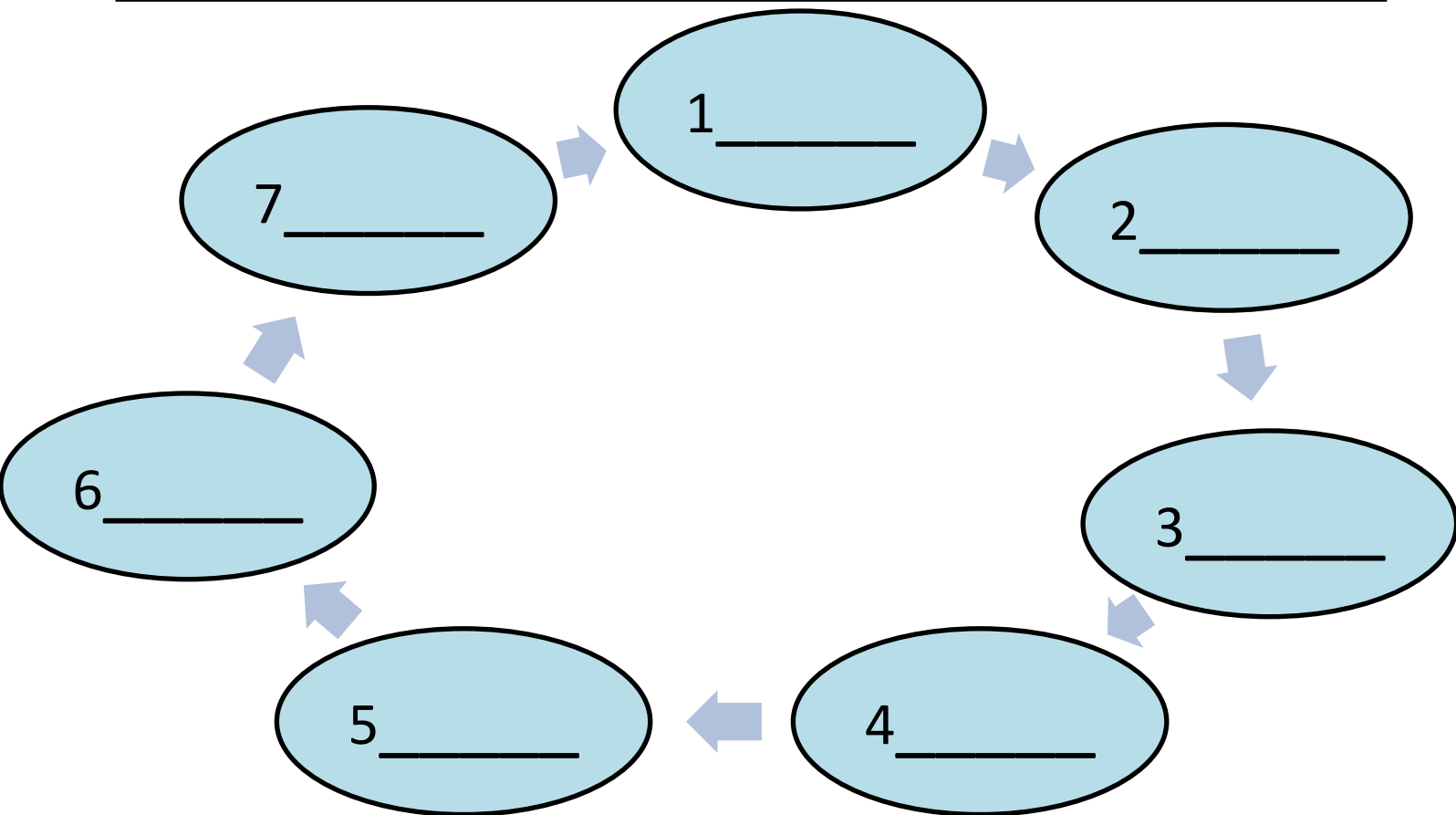
Date _____

Quality Manufacturing Processes

Directions: As you watch the video, you will complete two activities based upon what you learn: 1) the Engineering Cycle Diagram, and 2) the Audit Sheet Checklist.

Engineering Cycle Diagram – Place the steps in the engineering cycle from the Word Bank in the correct order in the diagram.

| Word Bank | | | |
|------------------------------|-----------------------|---------------------|-------------------------|
| Testing (Field/Lab/Customer) | Concept/Design | Auditing | Computer-Based Analysis |
| Customer Feedback | Prototype Development | Assembly/Production | |



**To be completed before the
Virtual Field Trip**

Audit Sheet Checklist – Imagine that you are a John Deere Auditor. List at least 5 items to check for as you audit the finished product.

1. _____
2. _____
3. _____
4. _____
5. _____

Reflection - You likely inspect and examine products to make sure they meet your needs, too! What are some examples of things you check on labels or read in reviews before you make a purchase?

Food:

Clothes:

Entertainment:

Games:

To be completed during the
Virtual Field Trip

Name _____

Date _____

Careers in Advanced Manufacturing Capture Sheet

Many careers come together in the engineering, supply management, and production of John Deere 8R Tractors. The demands of a growing population are resulting in strong job opportunities in this area. This Virtual Field Trip illustrates a variety of highly-skilled careers involved in advanced manufacturing and highlights how these professionals utilize technology and the engineering process to improve products and processes.

While watching the AgExplorer and John Deere Virtual Field Trip, complete the table below:

| List two background experiences/training opportunities each professional highlighted as influential. | |
|---|-------------------|
| Product Marketing Manager | 1. _____ 2. _____ |
| New Product Design Engineer | 1. _____ 2. _____ |
| Product Planner for Large Ag | 1. _____ 2. _____ |
| Production Supervisor | 1. _____ 2. _____ |
| Quality/Reliability | 1. _____ 2. _____ |
| Product Manager | |

To be completed during the
Virtual Field Trip

Now, match your own background / opportunities to the careers highlighted.

Which background experiences of yours mirror any that you heard during the video? Maybe you have built a model, held a leadership position in a club, or solved a challenging problem.

List two or three experiences below.

Have you heard of any of the high school courses or training opportunities mentioned by any of the professionals being available at your school?

If yes, list them below.

If no, which courses or opportunities would you be interested in exploring further to see if they could be offered at your school or through an extension/partnership program?

List **two** careers from the Virtual Field Trip that are most interesting to you based on your background, the training opportunities available to you and explain your selections.

Why is it important for a company like John Deere, or other agricultural companies, to have many different types of careers and employees?

Name _____

Date _____

Career Profile Research

Directions: Conduct research on www.agexplorer.com to further explore a career that you learned about in the Virtual Field Trip. Record your notes below.

| CAREER NAME _____ | |
|---|--|
| Brief Description | |
| Training & Skills Required | |
| Salary Range | |
| Related Careers | |
| Current Job openings, If available | |
| How this career impacts the agricultural industry | |
| Current classes I am taking that impact this career | |
| How this career matches my interests | |
| How this career matches my skills/strengths | |
| Training opportunities I would need in the future to pursue this career | |

Name _____

Date _____

From Design to Delivery

You have been asked to create a new design for a John Deere tractor that meets consumer demand for a high-quality, low emissions agricultural vehicle. To align with efficient manufacturing, your team will need to design, assemble, test, and deliver 5 identical “tractors” in 30 minutes. In order to create a successful design, you will need to work as a team to distribute the work.

Assign Roles!

Many different people work together to create the innovative and practical designs we see in agriculture, construction, and forestry machinery. Assign different roles to each member of your group.

| Job | Description | Student Name |
|--------------------------|---|---------------------|
| Foreman/woman | Plan, coordinate, budget, and supervise projects. | |
| Designer | Combine artistic talent with research on product use, marketing, and materials to create a functional design. | |
| Assembly/Quality Control | Examine products and materials for defects and monitor quality standards. | |
| Supply Chain Manager | Coordinate and manage the entire life cycle of a product. | |

The Criteria

Consumers have asked for the tractor to include the following characteristics:

Consistent: The tractors don’t have to look like tractors, but they should be identical and have at least four wheels, a chassis (base frame), and a cab.

Compact: The tractors must all fit in the lid of a copy box for “transport” and delivery to a predetermined location in the classroom at the end of the activity.

Durable: The tractors must all pass an audit by the teacher and/or their fellow classmates in which no visible defects are present.

Materials: Each team may only use materials provided by the teacher (the interlocking blocks) to build their tractors and the copy box lid for transport.

Which career role would be the best fit to monitor the criteria?

Activity #2

The Build

Work as a team to develop a prototype design, source the materials needed for production, assemble the 5 finished products, test/evaluate for quality control, and deliver the tractors to market by the deadline.

Your group is responsible for providing a multi-view, annotated sketch of your design and a complete materials list for each unit with delivery.

Use the chart below to keep track of how much time each team member spends on each task. There should be a fair and even division of labor for this project.

| DESCRIPTION OF TASK | PERSON(S) RESPONSIBLE | AMOUNT OF TIME SPENT ON TASK |
|---------------------|-----------------------|------------------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Audit, Evaluate, and Redesign

Complete an audit Gallery Walk of each group's products to check for consistency and durability based on the criteria listed in the table. After all groups have received feedback, you will have the opportunity to reflect on how you might modify your design or any of the processes involved in assembly or delivery to make improvements.

Which career role would be the best fit to monitor the audit? _____

| Design Elements | Audit | | |
|---|-------|----------|----|
| Consistent Tractors should be identical and have at least four wheels, a chassis (base frame), and a cab. | Yes | Somewhat | No |
| Compact Tractors fit in the lid of a copy box for “transport”. | Yes | Somewhat | No |
| Compact Tractors were successfully delivered to a predetermined location in the classroom in the allocated time. | Yes | Somewhat | No |
| Durable Tractors must all pass an audit by the teacher and/or their fellow classmates in which no visible defects are present. | Yes | Somewhat | No |
| Materials Used materials provided by the teacher. | Yes | Somewhat | No |
| Summary | | | |
| What features of this design did you find most effective? Why? | | | |
| What features of this design do you think could be a problem or not effective? Why? | | | |
| If you had an opportunity to redesign your tractor, what features of this design do you think you could incorporate to improve your design? | | | |