SCIENCE AND TECHNOLOGY

Grade: 6th
Developed by: Aimée Park

Subject: 6th Grade Science
Time Frame: 4 Weeks

STANDARDS

- STATE:
  - Know and apply concepts, principles, and processes of technological design. 11. B. 3a-f

- LOCAL:
  - SCI6C1S2 – The student will be able to understand and utilize technological design.
  - SCI6C2ES1 – The students will understand and be able to use simple and compound machines.

ENDURING UNDERSTANDINGS:

- Technology is any tool or machine designed to help people in some way.
- The development of technology depends on the work of both scientists and engineers.
  - Engineers use science to design technology.
  - Scientists use technology to study science.
- When engineers are designing a new technology, they go through a series of steps to solve a problem, such as technological design.

ESSENTIAL QUESTIONS:

- How are Technology and Science related?
- Technology : Science :: _____ : _____

KNOWLEDGE AND SKILLS:

The students will know:

- the basic characteristics and functions of simple and compound machines.
- the steps of technological design.

The students will be able to:

- take measurements and make calculations.
- use simple machines to create a compound machine.
- use technological design to solve a problem.
- make improvements to the technology of their compound machine using their understanding of simple machines.

ASSESSMENT EVIDENCE:

FINAL:
The students will be presenting their final product from the Interdisciplinary Project – Save the Princess! Storm the Castle! And, then the students will write a reflection paragraph on the relationship between Science and Technology.

G- The goal is to present a proposal to the Queen that persuades her to use your creation to save Princess Genevieve or attack King Snores O'Lot.

R- The students will be pretending to be knights presenting the guild's compound machine creation.

A- The compound machine will be presented to all the guilds and knights (peers from the class) and will be evaluated and assessed (graded) by the Queen (teacher).

S- The students will complete the first three parts of the Interdisciplinary Project – Save the Princess! Storm the Castle! Then, the students will plan their presentation following the presentation guidelines. Finally, the students will present their presentation and compound machine.

P- The product is a presentation that must explain the students' understanding of the machine, technology, and the technological process, and capture the attention of the Queen, and a reflective paragraph detailing their understanding of the relationship between technology and science.

S- The presentation and paragraph will be assessed using a rubric.

LEARNING ACTIVITIES:

W – Discussion of Essential Questions

H – Practicing Technological Design – Building Paper Towers
Introduction to the Interdisciplinary Project: Save the Princess! Storm the Castle! (Video)

E – Reading, Classroom Discussion, Mini-Activities, Computer Activities, Videos, and Project.

R – Interdisciplinary Project: Save the Princess! Storm the Castle! – Technological Design

E – Interdisciplinary Project: Save the Princess! Storm the Castle! – Presentation

T – Students work at their own pace and create their own designs. In addition, students can utilize teacher assistance at different levels. See *Unit 5 Differentiation Table*

O – See *Learning Activities Time Schedule*

LEARNING ACTIVITIES TIME SCHEDULE:

DAY	EVENTS
1	Discussion of Essential Questions Mini-Activity: Science and Technology – Part 1
2	SSSR Mini-Activity: Science and Technology – Part 2
3	Mini-Activity: Science and Technology – Part 2
4	Mini-Activity: Science and Technology – Part 2
5	Introducing Interdisciplinary Project "Storm the Castle or Save the Princess" Letter to the Parents Sample Models and Presentations – Video
6	Project – Part 1: Apprenticeship with the Master *Machines Pretest & Machines Pretest Review*
7	Project – Part 1: Apprenticeship with the Master *Mini-Activity: Machines Introduction* Video: Bill Nye the Science Guy - Simple Machines

8	Project – Part 1: Apprenticeship with the Master *Mini-Activity: Machines – Research* Let's see what we can find? - Simple Machine Photos
9	SSSR Project – Part 1: Apprenticeship with the Master *Mini-Activity: Machines – Research*
10	Project – Part 1: Apprenticeship with the Master *Mini-Activity: Machines – Research* Let's see what we can find? - Simple Machine Photos
11	Project – Part 1: Apprenticeship with the Master *Mini-Activity: Machines – Challenge*
12	SSSR Project – Part 2: Working within the Guild *Technological Design – Step 1 and 2*
13	Project – Part 2: Working within the Guild *Technological Design – Step 3*
14	Project – Part 2: Working within the Guild *Technological Design – Step 3*
15	Mini-Activity: Destroy the Castle
16	Project – Part 3: Pages becomes Squires *Testing Day* Project – Part 2: Working within the Guild *Technological Design – Step 4 and Step 5*
17	Project – Part 2: Working within the Guild *Technological Design – Step 5* Project – Part 4: Knights Proposal to the Queen *Presentation Plan*
18	Project – Part 4: Knights Proposal to the Queen *Presentation Plan*
19	SSSR Project – Part 4: Knights Proposal to the Queen *Presentation Plan*
20	Project – Part 4: Knights Proposal to the Queen *Final Presentation* Project – Self and Group Evaluation & Goals
21	Reflection – Essential Questions How are Science and Technology Related?

GRADING:

Day Assigned	Day Collected	Assignment	Scoring Method		Point Totals
			Type	Location	
1	2 & 5	Mini-Activity: Science and Technology	Rubric	1/Class	50
6	6	Project – Part 1 Machines Pretest	In Class & Rubric	Excel- 1/student	0
7	11 Due: 12	Project – Part 1 Mini-Activity: Machines	Rubric	Excel- 1/student	100
12	17-19	Project – Part 2 Technological Design	Rubric	Excel- 1/student	50
16	16	Project – Part 3 Compound Machine Test	Rubric	Excel- 1/student	50
15	16-18 Due: 19	Mini-Activity: Destroy the Castle	In Class	Paper	25
17-19	20-21	Project – Part 4 Presentation	Rubric	Excel- 1/student	200
20	21	Project – Evaluation	Rubric	Excel- 1/student	50
21	Due: 1 of Unit #6	Project – Reflective Paragraph	Rubric	Printed- 1/student	100
TOTAL POINTS					625

Lecture Notes

Unit Introduction

1. Introduce Unit.
2. Discuss Essential Question.
3. Ask students to describe what they believe Science and Technology mean. Try Think – Pair – Share Groups.
4. Distribute Mini-Activity: Science and Technology.
5. Read directions.
6. Read ScienceSaurus p355-358 and complete Mini-Activity sections *Science and Technology* & *Designing Technology*.
   - *Science and Technology* - Review notes: Science Scope "Technological Design"p6 & BLS printouts – engineering & science technician.
   - *Designing Technology* – Use ScienceSaurus and show: http://www.tcnj.edu/~dec2/The%20Design%20Loop%20Intro.html
7. Review instructions for "Technology & You." Instruct students to continue the assignment by reading ScienceSaurus p359-363, and then by working on the collage.
8. At the end of class:
   - Clean up
   - Summarize what students have discovered so far regarding technology.
     - Discuss homework:
     - Complete Collage

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Lecture Notes

Mini-Activity: Science & Technology - *Using Technological Design to Build Paper Towers* – Day 1

1. During SSR, check students' Mini-Activity: Science & Technology and Collage.
2. Discuss and display collages.
3. Introduce *Using Technological Design to Build Paper Towers.*
4. Students should read silently.
5. Students should complete Day One in the procedure.
6. At the end of class:
    - Clean up.
    - Summarize students' designs.
    - Ask students what they will be doing the next few days.
    - Discuss homework:
        - Read Mini-Activity "Using Technological Design to Build a Paper Tower" & Complete Day One

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Lecture Notes

Mini-Activity: Science & Technology - *Using Technological Design to Build Paper Towers* – Day 2

1. Review *Using Technological Design to Build Paper Towers* Day 2.
2. Students receive 25 minutes to build towers.
3. When students have completed their building students, should measure and sketch their design.
4. Test models with hair dryer. Students should record observations.
5. After testing is complete, students should complete the analysis.
6. At the end of class:
   - Clean up.
   - Summarize today's results.
   - Ask students what they will be doing tomorrow.
   - Discuss homework:
     - Complete Analysis – Day Two

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Lecture Notes

Mini-Activity: Science & Technology - *Using Technological Design to Build Paper Towers* – Day 3

1. Review *Using Technological Design to Build Paper Towers* Day 3.
2. Discuss *Successful Engineering Principles for Paper Tower Design*
3. Assign Student Groups.
4. Student groups receive 25 minutes to redesign and rebuild Towers.
5. When students have completed their building, students should measure and sketch their design.
6. Test models with hair dryer. Students should record observations.
7. After testing is complete, students should complete the analysis.
8. At the end of class:
   - Clean up.
   - Summarize today's results.
   - Discuss homework:
     - Complete Analysis – Day Three

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Lecture Notes

Project Introduction

1. Distribute Project Instructions Sheet.

2. Read through the instruction sheet with the students. Review Project Timeline.

3. Distribute Parents Letter.

4. Read through parent letter with the students.

5. Discuss Important Issues:
    A. Materials
    B. Cost
    C. Part 1, 2, 3, and 4
    D. Technological Design
    E. Construction of Model
    F. Planning for Presentation
    G. Evaluation of Self and Group

6. At the end of discussion, show a model constructed by students from last year and show video of past examples.

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Lecture Notes

Day 1 - Mini-Activity: Machines

1. Introduce students to the Mini-Activity: Machines. Explain that this Mini-Activity has two steps – first is research using books and lab stations and the second is a challenge that involves playing a game on the computer. Also explain how this will help them with their Project.

2. Before beginning the Mini-Activity we must go over a concept called work. Ask students to hypothesize: What is Work? (Think-Pair-Share)
    - THINK:
        - Consider the question silently.
        - Write notes on a scrap of paper.
    - PAIR:
        - Turn to your "Study Buddy" and discuss your thoughts.
        - Record your observations scrap of paper
    - SHARE:
        - Participate in a Class Discussion
        - Have a few volunteers record the class's thoughts on the board while sharing.

3. Write the following examples on the board:
    - 1. Reading a book
    - 2. Lifting a Box
    - 3. Doing Homework
    - 4. Carrying a box across the room

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4. Ask the students to work with their Study Buddy and hypothesize which of the examples is work. Write the numbers on their scrap paper.
5. Have the Study Buddy groups vote.
6. As a class, read the ScienceSaurus p280 as a class.
7. Ask students to discuss their thoughts again with their Study Buddies about which examples are work.
8. Have the Study Buddy groups vote again.
9. Go through the examples on the board and ask volunteers to explain why it is work or not.
10. Introduce Mini-Activity: Machines and Distribute
11. Place Overhead Copy on the Overhead Projector
12. Ask students to fill in their sheet with you as you use the overhead copy.
13. Lead students through the Machines Reading (Force and Motion) p2-5 and ScienceSaurus p280 and 283.
14. Show Video – Bill Nye the Science Guy: Simple Machines
15. Explain that the students should complete this assignment carefully.
16. Review the directions for completing the rest of the packet.
17. Explain that they may use the textbooks on their desk to begin their research.
    - Mini-Books: Simple Machines & Force and Motion
    - ScienceSaurus p 280-283
    - SCIENCE p292-311

Lecture Notes

Day 2 - Mini-Activity: Machines

1. Instruct the students to take out the Mini-Activity: Machines.
2. Explain the stations to the students.
3. Instruct students to complete their research.
4. If students complete the research early, instruct the students that they may continue to the Challenge.
5. Remind students about the importance of their research!
6. Clean up about ten minutes before bell.
7. Take a walk through school and take photos of items that are simple machines.

Day 3 - Mini-Activity: Machines

1. Instruct the students to take out the Mini-Activity: Machines.
2. Ask students if they have any questions about the stations.
3. Instruct students to complete their research.
4. If students complete the research early, instruct the students that they may continue to the Challenge.
5. Remind students about the importance of their research!

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Lecture Notes

Day 4 - Mini-Activity: Machines

1. Instruct the students to take out the Mini-Activity: Machines.
2. Ask students if they have any questions about the stations.
3. Instruct students to complete their research.
4. If students complete the research early, instruct the students that they may continue to the Challenge.
5. Remind students about the importance of their research!
6. Clean up about ten minutes before bell.
7. Take a walk through school and take photos of items that are simple machines.

Day 5 - Mini-Activity: Machines

1. Instruct the students to take out the Mini-Activity: Machines.
2. Ask students if they have any questions about the stations.
3. Explain to students that you will be checking their notes while they are working today.
4. Review the directions for the Challenge.
5. Instruct students to begin working on the Challenge if they have completed their research.

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Lecture Notes

Part 2: Technological Design Introduction

1. Distribute Technological Design Packet.

2. Read through the introduction and Part 1.

3. Discuss the Problem with the Students, and have the students write their results in the section for Part 1.

4. Read through Part 2.

5. Demonstrate to students:
   Mousetrap – simple machines in a series and one-touch start
   Castle of Kickfast, Princess Genevieve, and King Snores O'Lot – Goals

6. At the end of discussion, show a model constructed by students from last year and have students point out the one-touch start, series, and simple machines.

7. Assign the students to begin working on Part 2 and to complete this section for homework.

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6th GRADE SCIENCE: Today's Schedule

Day	Reminder	Science Agenda	Homework & Grading
UBD-Technological Design Day 1	***Copy:*** ***Unit #5 Title Page & Rubric*** ***Essential ? Poster*** ***Set Up Unit Checklist*** ***Magazines & String***	1. Write HMWK & Get Binder! 2. Begin SCIENCE MODE! 3. Unit Set Up 4. Discuss Essential Questions 5. Mini-Activity: Science and Technology a. Science & Technology b. Designing Technology c. Technology & You 5. Clean up & Close	Complete Collage ***Grade:*** ***Assessments (Plan & Collage))***
UBD-Technological Design Day 2		1. Write HMWK & Get Binder! 2. Begin SCIENCE MODE! 3. Take out Mini-Activity: Science and Technology & Collage 4. SSSR (10 minutes) 5. Mini-Activity: Science and Technology • Using Technological Design to Build Paper Towers (Day One) 6. Clean Up & Close	Complete Mini-Activity: Science and Technology Plan – Day One ***Grade:*** ***Mini-Activity (Class)*** ***Assessments (Plan)***
UBD-Technological Design Day 3	***Lab Supplies*** ***Newspaper, Tape, Scissors, & Rulers*** ***Hair Dryer***	1. Write HMWK & Get Binder! 2. Begin SCIENCE MODE! 3. Take out Mini-Activity: Science and Technology 4. Mini-Activity: Science and Technology • Using Technological Design to Build Paper Towers (Day Two) 5. Clean Up & Close	Complete Mini-Activity: Science and Technology Analysis – Day Two ***Grade:*** ***Mini-Activity (Class)*** ***Assessments (Plan)***
UBD-Technological Design Day 4	***Lab Supplies*** ***Newspaper, Tape, Scissors, & Rulers*** ***Hair Dryer***	1. Write HMWK & Get Binder! 2. Begin SCIENCE MODE! 3. Take out Mini-Activity: Science and Technology 4. Mini-Activity: Science and Technology • Using Technological Design to Build Paper Towers (Day Three) 5. Clean Up & Close	Complete Mini-Activity: Science and Technology Analysis – Day Three ***Grade:*** ***Mini-Activity (Class)*** ***Assessments (Plan)***
UBD-Technological Design Day 5	***Copy:*** ***Project Intro, Parent Letter, & Unit Cover Sheet*** ***Video – Past Presentations***	1. Write HMWK & Get Binder! 2. Begin SCIENCE MODE! 3. Turn in Mini-Activity: Science and Technology 4. Project Introduction • Introduction • Parent Letter • Past Presentations - Video	Get Assignment Notebook signed after parents read your parent letter. ***Grade:*** ***Mini-Activity & Assessments (Plan)***

6th GRADE SCIENCE: Today's Schedule

Day	Reminder	Science Agenda	Homework & Grading
UBD-Technological Design Day 6	***Copy:*** ***Part 1 Machines Pretest***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Project – Part 1** • **What do you know already? PRETEST** • **Let's find out how well you did!**	**None** ***Grade:*** ***Mini-Activity (Pretest)*** ***Assessments (Plan)***
UBD-Technological Design Day 7	***Copy:*** ***Part 1*** ***Mini-Activity: Machines*** ***Set up Packets/Books*** ***OH Projector*** ***Video – Machines Working Together***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Project – Part 1** • **Mini-Activity: Machines** • **Video: Bill Nye – Simple Machines**	**None** ***Grade:*** ***Mini-Activity (Video)*** ***Assessments (Plan)***
UBD-Technological Design Day 8	***Set up Mini-Activity: Machines Stations*** ***Get Digital Cameras***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Take out Mini-Activity: Machines** 4. **Project – Part 1** • **Mini-Activity: Machines** 5. **Clean Up & Close** 6. **Let's see what you can find?**	**Work on Mini-Activity: Machines** ***Grade:*** ***Mini-Activity (Class)*** ***Assessments (Plan)***
UBD-Technological Design Day 9		1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Take out Mini-Activity: Machines** 4. **SSSR (10 minutes)** 5. **Project – Part 1** • **Mini-Activity: Machines** 6. **Clean Up & Close**	**Work on Mini-Activity: Machines** ***Grade:*** ***Check Mini-Activity (Work Time & Plan)***
UBD-Technological Design Day 10	***Get Digital Cameras***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Take out Mini-Activity: Machines** 4. **Project – Part 1** • **Mini-Activity: Machines** 5. **Clean Up & Close** 6. **Let's see what you can find?**	**Work on Mini-Activity: Machines** ***Grade:*** ***Check Mini-Activity (Work Time & Plan)***

6th GRADE SCIENCE: Today's Schedule

Day	Reminder	Science Agenda	Homework & Grading
UBD-Technological Design Day 11	***Lap Tops*** ***LRC or Computer Access for Every Student***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Project – Part 1** • **Mini-Activity: Machines** • **CHALLENGE** 4. **Clean Up & Close Up**	**Complete Mini-Activity: Machines** ***Grade: Check Mini-Activity (Work Time & Plan)***
UBD-Technological Design Day 12	***Copy:*** ***Part 2 Technological Design*** ***Set up Sample Machines, Mouse Trap, and Castle***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **SSSR (10 minutes)** 4. **Turn in Mini-Activity: Machines** 5. **Take out Project Introduction (Review the directions for Part 2)** 6. **Project – Part 2** • **Step 1: Identify a Problem** • **Step 2: Brainstorm Solutions**	**Complete Project – Part 2 Step 2 Make sure to talk to your parents!** ***Grade: Check Mini-Activity (Work Time & Plan)***
UBD-Technological Design Day 13	***Take out Boards, Pulleys, String, Bean Bags, Hooks, Tools, etc.***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Take out Project – Part 2** 4. **Project – Part 2** • **Step 3: Select the Most Appropriate Design** • **Get Approval** • **Build and Test a Model** 5. **Clean Up & Close**	**After Approval - Build Model** ***Grade: Project – Part 2 (Upon Approval)) Check Mini-Activity (Work Time & Plan)***
UBD-Technological Design Day 14	*__Copy:__ ***Catapult Information***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Take out Project – Part 2** 4. **Project – Part 2** • **Step 3: Select the Most Appropriate Design** • **Get Approval** • **Step 4: Build and Test a Model** 5. **Clean Up & Close**	**After Approval - Build Model** ***Grade: Project – Part 2 (Upon Approval))***
UBD-Technological Design Day 15	***Copy:*** ***Mini-Activity: Destroy the Castle*** ***Lap Tops*** ***LRC or Computer Access for Every Student***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Mini-Activity: Destroy the Castle** 4. **Clean Up & Close**	**After Approval - Build Model** ***Grade: Project – Part 2 (Upon Approval))***

6th GRADE SCIENCE: Today's Schedule

Day	Reminder	Science Agenda	Homework & Grading
UBD-Technological Design Day 16	***Copy:*** ***Notes for testing & Part 3 Observations & Improvements*** ***Set up Castle for Testing Day!***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Take out Project – Part 2** 4. **Project – Part 2 & 3** • **Step 4 - Build and Test a Model** • **Step 5 – Evaluate Results and Suggest Improvements** 5. **Clean Up & Close**	**None** ***Grade:*** ***Project – Part 3*** ***(During Testing))***
UBD-Technological Design Day 17	***Answers for Mini-Activity: Destroy the Castle***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Take out Project – Part 2** 4. **Project – Part 2 & 4** • **Step 5 – Evaluate Results and Suggest Improvements** • **Get Approval** • **Part 4 & Step 6 – Share your Results** 5. **Mini-Activity: Destroy the Castle – Check Answers!** 6. **Clean Up & Close**	**Modify Model & Prepare Presentation** ***Grade:*** ***Project – Part 2*** ***(Upon Approval))***
UBD-Technological Design Day 18	***Answers for Mini-Activity: Destroy the Castle***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Take out Project – Part 2** 4. **Project – Part 2 & 4** • **Step 5 – Evaluate Results and Suggest Improvements** • **Get Approval** • **Part 4 & Step 6 – Share your Results** 5. **Mini-Activity: Destroy the Castle – Check Answers!** 6. **Clean Up & Close**	**Modify Model & Prepare Presentation** ***Grade:*** ***Project – Part 2*** ***(Upon Approval))***
UBD-Technological Design Day 19	***Note Cards*** ***Pass out Textbooks***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **SSSR (10 minutes)** 4. **Turn in Mini-Activity: Destroy the Castle** 5. **Take out Project – Part 2** 6. **Project – Part 4** • **Prepare Presentation Note Cards** 7. **New Textbooks - Astronomy** 8. **Clean Up & Close**	**Modify Model & Prepare Presentation** ***Grade:*** ***Project – Part 2*** ***(Upon Approval))*** ***Mini-Activity: Destroy the Castle*** ***(Work Time &Plan)***
UBD-Technological Design Day 20	***Copy:*** ***Presentation Rubric & Unit Evaluation*** ***Set up Video Camera & Castle***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Turn in Project – Part 4** • **Presentation Plan** 4. **Project – Part 4** • **Presentations** 5. **Unit Evaluation**	**Complete Unit Evaluation** ***Grade:*** ***Project – Part 4*** ***(During Presentations)*** ***Mini-Activity: Destroy the Castle (Plan)***

6th GRADE SCIENCE: Today's Schedule

Day	Reminder	Science Agenda	Homework & Grading
UBD-Technological Design Day 21	***Copy:*** ***Paragraph Rubric***	1. **Write HMWK & Get Binder!** 2. **Begin SCIENCE MODE!** 3. **Turn in Unit Evaluation** 4. **Project – Part 4** • **Presentations** 5. **Remove Technology Hangers** 6. **Essential Question Discussion** 7. **Reflective Paragraph – Write your thoughts!**	**Complete Reflective Paragraph** ***Grade:*** ***Project – Part 4 (During Presentations & Plan)***

Created by Aimee Park

Interdisciplinary Project:

Save the Princess!

Storm the Castle!

Name(s):_____
_____
_____
_____
Period: _____ Date: / /
Group #: ____ Drawer #: _____

Project Introduction

During the Medieval Times, it was not uncommon for a castle to be attacked or for a prisoner to be saved from the hands of the enemy. Because there wasn't the technology we have today, various simple and compound machines were utilized during these encounters. Catapults, trebuchets, and battering arms were considered the top-notch weapons for warmongers. All of these machines have played a part in the technology we have today.

Simple machines were not only used for assaults, but were also seen in construction. The Pyramids of Egypt, the Great Wall of China, and the wonderful castles throughout Europe are some of the amazing buildings constructed by early civilizations that primarily used simple and compound machines in their construction. Ancient engineers and architects knew how to use simple machines to greatly multiply the force their workers could apply.

In your literature and social studies classes, you have delved into the Middle Ages - Huzzah! Now it is time for science to join the fun! In this project, you will not only use your knowledge of the Middle Ages and Machines, but you will also use the process of Technological Design to create a compound machine befitting of the Medieval Times.

Project Requirements

Part 1: Apprenticeship with the Master

- In order to be accepted in the Metal Workers' or Blacksmiths' Guilds during the Middle Ages, an individual would first be required to work as an apprentice.
- To begin the project, you will work as an apprentice and learn as much as possible from your master. What will your master teach you? The workings of simple and compound machines of course!
- To complete your apprenticeship, you must prove yourself by successfully completing your Mini-Activity: Machines!

Part 2: Working within the Guild

- Once you are accepted as a member of the Guild, you begin working your trade. However, you will be called upon or challenged by the Queen of Lisle Forest to create new and advanced weapons or tools!
- In this part of your project, the Queen of Lisle Forest has called upon you to use "Technological Design" to create a compound machine. The machine will be tested by squires, and then you will have the opportunity to perfect the compound machine before it is presented to the Queen. Make sure to follow the Queens instructions or it could be off to the dungeon for you!

Part 3: Pages becoming Squires

- Once a page has reached a certain age, he/she may become a squire and train with a knight! To become a squire, you will work with a knight in a mock battle to storm the castle or save the princess!
- In this part of the project, you will test the compound machine for the guilds and suggest improvements.

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- **Part 4: Knights Proposal to the Queen**
  - There is trouble in the land, and the Queen has called upon her kingdom! The Queen's daughter, Genevieve, has been abducted by King Snores O'Lot from the neighboring Kingdom of Kickfast. As a result, the skilled squires will be promoted to knighthood.
  - In this part of the project, the Queen has demanded that her daughter be rescued and King Snores O'Lot be destroyed! The Queen has commanded that the new knights present the guilds latest creations so that a plan of action may be determined!
  - To make a proposal to the Queen, the knights must prepare a presentation. The Queen is very intelligent and is fascinated with Science and Technology! Therefore, your presentation needs to include many details which will impress the Queen! Remember you are also trying to persuade the Queen to use your machine! If the Queen does choose your machine, this could mean very good things for you!

Project Materials

Pulleys, string, and tape may be used for the class period. All other materials must be provided by your group and approved by your teacher. If you have trouble finding materials, ask your teacher or parents for suggestions! You may use toys just be creative and disguise these materials to fit in the Middle Ages!

Project Hints

- Use your apprenticeship to help you build this machine! That means make the most of your Mini-Activity: Machines. Don't just complete the assignment to finish it! Make sure you understand what you are doing. Ask lots of questions!
- When working in a group:
  - Remember everyone has different schedules and different family responsibilities. Be respectful of different families, and try to work around everyone's schedule.
  - Try to be open-minded and carefully consider the opinions expressed by all group members. Approach the task on the basis of logic, not preconceived notions.
  - Make sure every group member expresses an opinion on each issue.
  - Avoid changing your mind merely to avoid conflict or voting on ideas. Support only solutions with which you are able to agree at least somewhat.
  - View differences of opinion as a help, rather than a hindrance. They reveal issues that might otherwise be overlooked.
- Stay on top of due dates and deadlines. Don't procrastinate! And, don't rush!

Project Time Line

TASK		DESCRIPTION	DUE DATES
1.	Apprenticeship with the Master	Students will complete Mini-Activity: Machines.	DUE DATE:
2.	Working within the Guild	Students follow the stages of "Technological Design"	STEP 1 & 2: STEP 3: STEP 4: STEP 5:
3.	Pages becoming Squires	Squires can test their machine throughout the process, but the entire class will test their machines on this day.	TESTING DATE:
4.	Knights Proposal to the Queen	To prepare, the group completes the presentation plan. Final presentations take place during class on this day.	PLAN DUE DATE: PRESENTATION DATE:

Interdisciplinary Project:

Save the Princess!

Storm the Castle!

Name(s):_____
_____
_____
_____
Period: _____ Date: / /
Group #: ____ Drawer #: _____

Part 2: Working within the Guild

Congratulations! Due to your success as an apprentice, you have been accepted as a member of the Guild! Hazzah! It appears that all of your hard work has paid off! While it would be great to settle into your new job, the Queen just issued a royal decree:

All members of the Guilds in the Kingdom of Lisle Forests are challenged to create a new and advanced weapon or tool! The guild member that creates the most impressive weapon or tool will receive a generous gift for the Queen of Lisle Forest.

The Queen of Lisle Forest has called upon you to use "Technological Design" to create a new compound machine! This is very exciting! The machine you create will be tested by squires, and then you will have the opportunity to perfect the machine before it is presented to the Queen. So, let's get started on our technological design!

☐ TECHNOLOGICAL DESIGN STEP 1: IDENTIFY A PROBLEM

Identifying the problem is a basic step in all scientific investigations! Since it was not uncommon for a castle to be attacked or for a prisoner to be saved from the hands of the enemy during the Middle Ages, we will identify the problem in this situation. Write your thoughts in the space provided.

TECHNOLOGICAL DESIGN STEP 2: BRAINSTORM DESIGN SOLUTIONS

Because you do not have modern machines or weapons, you need to find a way to solve this problem using a compound machine! Use the space on the next page to sketch designs for a compound machine that will allow you to "Storm the Castle" or "Save the Princess." To make sure you are on the right track please review the requirements!
To gain a few ideas, check out: www.scilinks.org. Log in as a guest and enter this code: SS110601.

The compound machine must…

- ✓ be made of at least THREE different simple machines.
- ✓ be in a series that begins with only one touch.
- ✓ be a model that resembles a machine from the Middle Ages.

The compound machine must either…

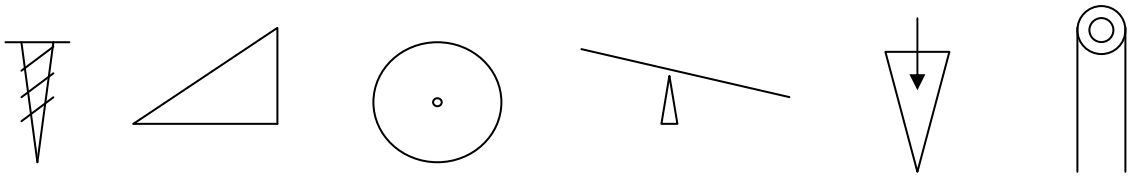
- ✓ "Save the Princess" by stopping at the Princess's window which is 61 centimeters from the floor. *If the machine can safely return the Princess to the ground, extra points will be granted!*

or

- ✓ "Storm the Castle" by launching a beanbag through a target which is 11 centimeters in diameter and 61 centimeters from the floor. *If the machine can successfully launch the beanbag through the target and knock over King Snores O'Lot extra points will be granted!*

Aimee Park

Brainstorming - Compound Machine Designs



Brainstorming - Construction of Compound Machines

Consider a plan for building this compound machine. If it was just you working on this machine, would you prefer to build this model on the weekend? Would you like your family to help? Would you like to build the model in school during study hall, early morning, or after school? Do you know someone who could help you build the model? Ask your family when you will be available to work on this project. If you would like your family's help, also ask when your family is available to help you. Make notes in the space below about your ideal plan for construction. By doing so, your group will be able to compare schedules and family responsibilities when you meet to create your group plan in class.

☐ TECHNOLOGICAL DESIGN STEP 3: SELECT THE MOST APPROPRIATE DESIGN

Discussion of Design Brainstorming Ideas

Each person in your guild has designed their own solution to the problem. When you meet as a guild group, take time to listen to each person as they explain their design in detail. As each guild member shares their design, write a few notes in the boxes below.

Designer	Description of the Design	Positives

"Storm the Castle" or "Save the Princess"

After discussing each design, decide if your guild will work to "Storm the Castle" or "Save the Princess," and work together to create one final design that all of the members of your guild agree upon.

Guild Decision: (circle one) "Storm the Castle" or "Save the Princess"

Compound Machine Design

Sketch the compound machine that you are going to build in the box below. This is like a blue print for construction so include measurements and dimensions! Also, make sure to label the simple machines and draw arrows to show the series!

Materials Plan

In the table below, list the materials your group will need to construct the machine, the person responsible for getting each item, and the phone number of that person. Calls should be made to discuss ideas, to remind each other of our responsibilities to the group, or to arrange meetings outside of class if you so desire.

Materials	Group Member	Phone Number

Construction Plan

Discuss your plan for completing the construction of the compound machine. Review your individual plans and decide if you are going to build this model during the week or on the weekend, if you are going to ask parents for help or if you are going to do it alone, or if you are going to work on the model in school during study hall or early morning. To earn all the total points possible, each group member must contribute to the building process. Describe your plan for working together to build the model in the space below:

Master Guilder's (Teacher) Approval

☐ TECHNOLOGICAL DESIGN STEP 4: BUILD AND TEST A MODEL

Once you have your design approved, you may begin constructing your machine. Please remember to follow these cosntruction guidelines.

Construction Guidelines

1. Be resourceful and use items that you already have lying around the house!
2. If you do want to purchase items, get parental permission first and make sure to share the cost within your group!
3. Enlist the help of family members to help construct your compound machine. It is perfectly acceptable to ask your family to help construct your model. It is also a great idea if all group members can be part of the building process. Keep in mind that this may be unrealistic with different family schedules. The most important thing to remember is to use the design your group created. If you want to change the design, your group should attempt to discuss ideas before your "construction team" makes changes!
4. If you are unable to meet at home, remember to make arrangements with your teacher to work at school! There are many times available – before school, study hall, and after school.
5. Be mindful of the due dates! This means two things – don't rush and don't procrastinate!

Testing Results

Guild members should use this page to record results of the Squires' test. BE AS SPECIFIC AS POSSIBLE! The more information you record, the better the changes you will be able to make to your machine!

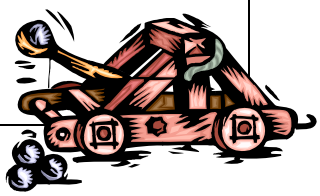
	Observations		
Simple Machine #1:			
Simple Machine #2:			
Simple Machine #3:			
Aim			
Distance/Positioning			
Trials	Trial #1	Trial #2	Trials #3

☐ TECHNOLOGICAL DESIGN STEP 5: EVALUATE RESULTS & SUGGEST CHANGES

Once you have tested your machine, review your testing notes and the notes from other Squires, Knights, and Guild members. Based on all of this information, make a decision as a group about any modifications to your compound machine.

Compound Machine Modifications Design

Sketch the modifications that you are going to make to your compound machine in the box below. This is like a blue print for construction of modifications so include measurements and dimensions! Also, make sure to label the simple machines and draw arrows to show the series!



Materials Plan

In the table below, list the materials your group will need to modify the machine, the person responsible for getting each item, and the phone number of that person.

Materials	Group Member	Phone Number

Construction Plan

Now discuss your plan for completing the construction of the modifications to this machine. Describe your plan in the space below:

Master Guilder's (Teacher) Approval

☐ TECHNOLOGICAL DESIGN STEP 6: SHARE YOUR RESULTS

Once you have received approval on your improvements, it is time to prepare for your presentation. First, complete the presentation plan. Then, prepare for the presentation by creating note cards or typing a presentation script.

Interdisciplinary Project:

Save the Princess!

Storm the Castle!

Name: _____
Period: _____ Date: / /
Group #: ____

Part 3: Pages become Squires

- Once a page has reached a certain age, he/she may become a squire and train with a knight! Today, all the pages will become squires and work with a knight in a mock battle to storm the castle and save the princess!

- In today's mock battle, you will test the compound machine for the guild. In addition to testing the machine, you will also be making observations and suggesting improvements for yourself and the other guilds.

- The observations and improvement suggestions you must make during today's testing of the guild's machines requires you to accomplish two tasks.
  - You must make observations of your own machine, and record these observations in your Project – Part 2: Technological Design (page 5). These observations need to be specific.
    - Include descriptions of what happened with each simple machine. How did the simple machine perform?
    - Include observations about the aim. How was the aim of the machine to the goal? Does the aim need to be improved?
    - Include observations about the distance and positioning. How did the machine need to be positioned? How far did the machine need to be placed from the castle?
    - Include detailed observations about each trial. What happened in each trial? How far off from the goal?
  - You must make observations of the other guild's machines, and make suggestions for improvements. These observations and suggestions for improvements should be recorded in the table on the back of this page.
    - In the **Machine Observations** column, include observations about each of the other guild's machine.
      - What was the one touch start?
      - What is the series?
      - How did the simple machines perform?
      - How was the aim?
      - How was the distance and positioning?
      - Does the machine look like it is from the Middle Ages?
    - In the **Suggestions for Improvements** column, include suggestions on how the guild could improve their machine.
      - How could the simple machine's performance be approved?
      - How could a simple machine be added to the compound machine?
      - How could the aim be improved?
      - How could the machine be improved to look more like the Middle Ages?
- After completing the table on the back of the page, first show it to your teacher. Then, cut the paper into strips and give each strip to the correct group.

- When your group has received your strips, review the comments of your peers and discuss your machine's performance. Then, begin completing Step 5 – Evaluate and Suggest Improvements in Project – Part 2: Technological Design (page 6).

Guild (Group) Number	Machine Observations	Suggestions for Improvements

Interdisciplinary Project:

Save the Princess!

Storm the Castle!

Name(s):_____
_____
_____
_____
Period: _____ Date: / /
Group #: ____ Drawer #: _____
Plan Due Date: / /
Presentation Date: / /

Part 4: Knights Proposal to the Queen

- There is trouble in the land, and the Queen has called upon her kingdom! The Queen's daughter, Genevieve, has been abducted by King Snores O'Lot from the neighboring Kingdom of Kickfast. As a result, the skilled squires are promoted to knighthood.
- The Queen has demanded that her daughter be rescued and King Snores O'Lot be destroyed! The Queen has commanded that all new knights present the guilds' latest creations so that a plan of action may be determined!
- To make a proposal to the Queen, the knights must prepare a presentation. The Queen is very intelligent and is fascinated with Science and Technology! Therefore, the presentation needs to include many details which will impress the Queen! Remember you are trying to persuade the Queen to use your machine! If the Queen chooses your machine, this could mean very good things for you!

Proposal Requirements:

The proposal must include a(n)…

- ☐ Introduction
  - Address the Queen – Think about our Field Trip!
  - What are the knights' names?
  - What Guild are you representing?
- ☐ Description of how the Compound Machine functions:
  - What is the one-touch start?
  - What happens after the one-touch start?
  - What is the correct name of each Simple Machine?
  - How will the machine reach its goal?
- ☐ Description of how the Compound Machine makes Work easier:
  - Describe the force and distance of each simple machine.
  - How does each simple machine make work easier?
- ☐ Description of the Historical Accuracy of the Compound Machine:
  - Use what you learned in Social Studies and Literature.
  - Is this machine realistic to the Middle Ages?
  - How would this machine function in the Middle Ages?
- ☐ Information about the "Technological Design" process:
  - What did you learn after your first test?
  - What did you do to fix the problems?
- ☐ Visual Aid:
  - Have your model machine available!
  - Provide a detailed sketch or photograph of your compound machine with the each machine and its function labeled.

The proposal must…

- ❖ include all knights and guild members speaking!
- ❖ influence the Queen to go with your idea!
- ❖ be memorized! *Note cards or a printed script may not be read directly, but may be used when your memory fails.*

Aimee Park

PLAN - PART 4: KNIGHTS PROPOSAL TO THE QUE

Introduction	How will you address the Queen?	Knights Names: Knight _____ Knight _____ Knight _____ Knight _____ Knight _____	Guild's (Group) Name:
How does the Compound Machine Functions?	What is the one-touch start?	What happens after the one-touch start?	How will the machine reach its goal?

How does the Compound Machine make Work easier?	Simple Machine	Force X Distance = Work	Description

Is the Compound Machine Historically Accurate?	Is this machine realistic to the Middle Ages?	How would this machine function in the Middle Ages?
What did you learn from the "Technological Design" process?	What did you learn after your first test?	What did you do to fix the problems?

Unit #5

Interdisciplinary Project:
Save the Princess!
Storm the Castle!

Name: _____

Period: _____ Date: / /

Unit Pretest Score: _____/50

RUBRIC

5	4	3	2	1
Extremely Accurate Display, Explanation, and Presentation *(Bull's-eye!)*	**Accurate** Display, Explanation, and Presentation *(Threw the dart and made it within the first ring)*	**Fairly Accurate** Display, Explanation, and Presentation *(Threw the dart and made it within the second ring)*	**Good Attempt** at Display, Explanation, and Presentation *(Threw the dart and just made it on the dart board)*	**Attempt** at Display, Explanation, and Presentation *(Threw the dart but completely missed the dart board)*

Project – Part 1: Apprenticeship with the Master (Mini-Activity: Machines)

- Notes: Work = Force X Distance 5 4 3 2 1
- What is it? (Definition & Examples) 5 4 3 2 1
- How does it look? (Labeled Sketch) 5 4 3 2 1
- How is it used? (Explanation) 5 4 3 2 1
- How does it make work easier? (Description) 5 4 3 2 1
- Results
  - Data and Calculations 5 4 3 2 1
  - Responses to Questions 5 4 3 2 1
- Compound Machine
  - Notes 5 4 3 2 1
  - Can Opener 5 4 3 2 1
  - Fishing Pole 5 4 3 2 1

Points: _____ ÷ 10 = _____ Final Grade: _____/50

Challenge Points: _____ ÷ 304 = _____ Final Grade: _____/50

Project – Part 2: Working within the Guild (Technological Design)

- Step 1: Identify a Problem 5 4 3 2 1
- Step 2: Brainstorm Design Solutions 5 4 3 2 1
- Step 3: Select the Most Appropriate Design 5 4 3 2 1
  - Approval: _____
- Step 4: Build and Test a Model 5 4 3 2 1
  - Building of the Model: _____ (If line is not checked, the grade is lowered one full grade.)
- Step 5: Evaluate Results and Suggest Changes 5 4 3 2 1
  - Approval: _____

Points: _____ ÷ 5 = _____ Final Grade: _____/50

Project – Part 3: Pages becoming Squires (Machine, Testing & Observations)

- One-Touch Start & Machines in a Series 5 4 3 2 1
- Three Simple Machines 5 4 3 2 1
- Medieval Appearance 5 4 3 2 1
- Other Group - Observations 5 4 3 2 1
- Other Group - Suggestions 5 4 3 2 1

Points: _____ ÷ 5 = _____ Final Grade: _____/50

Unit #5

Interdisciplinary Project:
Save the Princess!
Storm the Castle!

Names: _____
_____
_____
_____

Period: _____ Date: / /

RUBRIC

5	4	3	2	1
Extremely Accurate Display, Explanation, and Presentation *(Bull's-eye!)*	**Accurate** Display, Explanation, and Presentation *(Threw the dart and made it within the first ring)*	**Fairly Accurate** Display, Explanation, and Presentation *(Threw the dart and made it within the second ring)*	**Good Attempt** at Display, Explanation, and Presentation *(Threw the dart and just made it on the dart board)*	**Attempt** at Display, Explanation, and Presentation *(Threw the dart but completely missed the dart board)*

Project – Part 4: Knights Proposal to the Queen (Final Presentation)

1. Compound Machine _____ /35
   - One-Touch Start 5 4 3 2 1
   - Three Simple Machines
     - Lever- 1st, 2nd, or 3rd Class: _____ 5 4 3 2 1
     - Inclined Plane: _____ 5 4 3 2 1
     - Wheel and Axle: _____ 5 4 3 2 1
     - Screw: _____ 5 4 3 2 1
     - Wedge: _____ 5 4 3 2 1
     - Pulley – fixed or movable: _____ 5 4 3 2 1
   - Compound Machine in a Series 5 4 3 2 1
   - Medieval Appearance 5 4 3 2 1
   - Attains Goal 5 4 3 2 1
     - Stops at Princess Genevieve's window: _____
     - Launches a beanbag through a target: _____
2. Compound Machine (Extra Credit) _____ /0
   - Storm or Save: 5 4 3 2 1
     - Safely returned Princess Genevieve to the ground: _____
     - Hit King Snores O'Lot inside the castle: _____
   - Additional Compound Machines:
     - One-touch Start 5 4 3 2 1
     - Three Simple Machines 5 4 3 2 1
     - Compound Machine in a Series 5 4 3 2 1
     - Attains Goal 5 4 3 2 1
   - Middle Ages Costumes 5 4 3 2 1
   - Other: _____ 5 4 3 2 1
3. Final Presentation Plan _____ /15
   - Accuracy 5 4 3 2 1
   - Following Directions 5 4 3 2 1
   - Completion 5 4 3 2 1
   - Presentation Preparation: _____ (If line is not checked, the grade is lowered one full grade.)

4. Final Presentation – Content						_____ /55
➢ Introduction	5	4	3	2	1	
▪ Greeting Queen: _____						
▪ Knights Names: _____						
▪ Name of Guild: _____						
➢ Compound Machine Function Description	5	4	3	2	1	
▪ One-touch Start: _____						
▪ Series Description: _____						
▪ Attainment of Goal: _____						
➢ How does the each Simple Machine make work easier?						
▪ Simple Machines Identification	5	4	3	2	1	
▪ 1st - _____	5	4	3	2	1	
▪ 2nd - _____	5	4	3	2	1	
▪ 3rd - _____	5	4	3	2	1	
➢ Medieval Perspective	5	4	3	2	1	
▪ Is this machine realistic to the Middle Ages? _____						
▪ How would this machine function in the Middle Ages? _____						
➢ Technological Design						
▪ What did you learn after your first test?	5	4	3	2	1	
▪ What did you do to fix the problems?	5	4	3	2	1	
➢ Visual Aid						
▪ Sketch or Photo	5	4	3	2	1	
▪ Labels	5	4	3	2	1	
5. Final Presentation – Format						_____ /25
➢ GROUP Presentation – All Members Participate	5	4	3	2	1	
➢ Eye Contact and Speaking not Reading	5	4	3	2	1	
➢ Professionalism	5	4	3	2	1	
➢ Volume	5	4	3	2	1	
➢ Overall Preparedness	5	4	3	2	1	

Points: _____ ÷ 26 = _____ **Final Grade: _____/200**

Project: Group Work & Class Participation

➢ Technological Design	5	4	3	2	1
➢ Model – Original & Revised Construction	5	4	3	2	1
➢ Presentation Planning	5	4	3	2	1
➢ Presentation Preparation	5	4	3	2	1
➢ General Working Attitude	5	4	3	2	1

Points: _____ ÷ 5 = _____ **Final Grade: _____/50**

Created by Aimee Park

Unit #5

Interdisciplinary Project:
Save the Princess!
Storm the Castle!

Name: _____

Period: _____ Date: / /

Unit Pretest Score: _____/50

RUBRIC

5	4	3	2	1
Extremely Accurate Display, Explanation, and Presentation *(Bull's-eye!)*	**Accurate** Display, Explanation, and Presentation *(Threw the dart and made it within the first ring)*	**Fairly Accurate** Display, Explanation, and Presentation *(Threw the dart and made it within the second ring)*	**Good Attempt** at Display, Explanation, and Presentation *(Threw the dart and just made it on the dart board)*	**Attempt** at Display, Explanation, and Presentation *(Threw the dart but completely missed the dart board)*

Project – Part 1: Apprenticeship with the Master (Mini-Activity: Machines)

- Notes: Work = Force X Distance 5 4 3 2 1
- What is it? (Definition & Examples) 5 4 3 2 1
- How does it look? (Labeled Sketch) 5 4 3 2 1
- How is it used? (Explanation) 5 4 3 2 1
- How does it make work easier? (Description) 5 4 3 2 1
- Results
  - Data and Calculations 5 4 3 2 1
  - Responses to Questions 5 4 3 2 1
- Compound Machine
  - Notes 5 4 3 2 1
  - Can Opener 5 4 3 2 1
  - Fishing Pole 5 4 3 2 1

Points: _____ ÷ 10 = _____ Final Grade: _____/50

Challenge Points: _____ ÷ 304 = _____ Final Grade: _____/50

Project – Part 2: Working within the Guild (Technological Design)

- Step 1: Identify a Problem 5 4 3 2 1
- Step 2: Brainstorm Design Solutions 5 4 3 2 1
- Step 3: Select the Most Appropriate Design 5 4 3 2 1
  - Approval: _____
- Step 4: Build and Test a Model 5 4 3 2 1
  - Building of the Model: _____ (If line is not checked, the grade is lowered one full grade.)
- Step 5: Evaluate Results and Suggest Changes 5 4 3 2 1
  - Approval: _____

Points: _____ ÷ 5 = _____ Final Grade: _____/50

Project – Part 3: Pages becoming Squires (Machine, Testing & Observations)

- One-Touch Start & Machines in a Series 5 4 3 2 1
- Three Simple Machines 5 4 3 2 1
- Medieval Appearance 5 4 3 2 1
- Other Group - Observations 5 4 3 2 1
- Other Group - Suggestions 5 4 3 2 1

Points: _____ ÷ 5 = _____ Final Grade: _____/50

Unit #5

Interdisciplinary Project:
Save the Princess!
Storm the Castle!

Names: _____
_____
_____
_____

Period: _____ Date: / /

RUBRIC

5	4	3	2	1
Extremely Accurate Display, Explanation, and Presentation *(Bull's-eye!)*	**Accurate** Display, Explanation, and Presentation *(Threw the dart and made it within the first ring)*	**Fairly Accurate** Display, Explanation, and Presentation *(Threw the dart and made it within the second ring)*	**Good Attempt** at Display, Explanation, and Presentation *(Threw the dart and just made it on the dart board)*	**Attempt** at Display, Explanation, and Presentation *(Threw the dart but completely missed the dart board)*

Project – Part 4: Knights Proposal to the Queen (Final Presentation)

1. Compound Machine _____ /35
   - One-Touch Start 5 4 3 2 1
   - Three Simple Machines
     - Lever- 1st, 2nd, or 3rd Class: _____ 5 4 3 2 1
     - Inclined Plane: _____ 5 4 3 2 1
     - Wheel and Axle: _____ 5 4 3 2 1
     - Screw: _____ 5 4 3 2 1
     - Wedge: _____ 5 4 3 2 1
     - Pulley – fixed or movable: _____ 5 4 3 2 1
   - Compound Machine in a Series 5 4 3 2 1
   - Medieval Appearance 5 4 3 2 1
   - Attains Goal 5 4 3 2 1
     - Stops at Princess Genevieve's window: _____
     - Launches a beanbag through a target: _____
2. Compound Machine (Extra Credit) _____ /0
   - Storm or Save: 5 4 3 2 1
     - Safely returned Princess Genevieve to the ground: _____
     - Hit King Snores O'Lot inside the castle: _____
   - Additional Compound Machines:
     - One-touch Start 5 4 3 2 1
     - Three Simple Machines 5 4 3 2 1
     - Compound Machine in a Series 5 4 3 2 1
     - Attains Goal 5 4 3 2 1
   - Middle Ages Costumes 5 4 3 2 1
   - Other: _____ 5 4 3 2 1
3. Final Presentation Plan _____ /15
   - Accuracy 5 4 3 2 1
   - Following Directions 5 4 3 2 1
   - Completion 5 4 3 2 1
   - Presentation Preparation: _____ (If line is not checked, the grade is lowered one full grade.)

4. Final Presentation – Content						_____ /55
➢ Introduction	5	4	3	2	1	
▪ Greeting Queen: _____						
▪ Knights Names: _____						
▪ Name of Guild: _____						
➢ Compound Machine Function Description	5	4	3	2	1	
▪ One-touch Start: _____						
▪ Series Description: _____						
▪ Attainment of Goal: _____						
➢ How does the each Simple Machine make work easier?						
▪ Simple Machines Identification	5	4	3	2	1	
▪ 1st - _____	5	4	3	2	1	
▪ 2nd - _____	5	4	3	2	1	
▪ 3rd - _____	5	4	3	2	1	
➢ Medieval Perspective	5	4	3	2	1	
▪ Is this machine realistic to the Middle Ages? _____						
▪ How would this machine function in the Middle Ages? _____						
➢ Technological Design						
▪ What did you learn after your first test?	5	4	3	2	1	
▪ What did you do to fix the problems?	5	4	3	2	1	
➢ Visual Aid						
▪ Sketch or Photo	5	4	3	2	1	
▪ Labels	5	4	3	2	1	
5. Final Presentation – Format						_____ /25
➢ GROUP Presentation – All Members Participate	5	4	3	2	1	
➢ Eye Contact and Speaking not Reading	5	4	3	2	1	
➢ Professionalism	5	4	3	2	1	
➢ Volume	5	4	3	2	1	
➢ Overall Preparedness	5	4	3	2	1	

Points: _____ ÷ 26 = _____ **Final Grade: _____/200**

Project: Group Work & Class Participation

➢ Technological Design	5	4	3	2	1
➢ Model – Original & Revised Construction	5	4	3	2	1
➢ Presentation Planning	5	4	3	2	1
➢ Presentation Preparation	5	4	3	2	1
➢ General Working Attitude	5	4	3	2	1

Points: _____ ÷ 5 = _____ **Final Grade: _____/50**

Created by Aimee Park

Unit #5

Interdisciplinary Project:
Save the Princess!
Storm the Castle!

Name: _____

Period: _____ Date: _____

Machine Pretest Score: _____ /50

RUBRIC

5	4	3	2	1
Extremely Accurate Display, Explanation, and Presentation *(Bull's-eye!)*	**Accurate** Display, Explanation, and Presentation *(Threw the dart and*	**Fairly Accurate** Display, Explanation, and Presentation *(Threw the dart and*	**Good Attempt** at Display, Explanation, and Presentation *(Threw the dart and*	**Attempt** at Display, Explanation, and Presentation *(Threw the dart but*

Project – Part 1: Apprenticeship with the Master (Mini-Activity: Machines)

Notes: Work = Force X Distance					
What is it? (Definition & Examples)					
How does it look? (Labeled Sketch)					
How is it used? (Explanation)					
How does it make work easier? (Description)					
Results					
Data and Calculations					
Responses to Questions					
Compound Machine					
Notes					
Can Opener					
Fishing Pole					

Points: 0 ÷ 10 = 0.00 Final Grade: _____ /50

Points: 0 ÷ 304 = 0 % Final Grade: 0.5 /50

Comments:

Project – Part 2: Working within the Guild (Technological Design)

Step 1: Identify a Problem					
Step 2: Brainstorm Design Solutions					
Step 3: Select the Most Appropriate Design					
_____ Teacher Approval					
Step 4: Build and Test a Model					
_____ Building Model (If line is not marked, grade is lowered one full grade.)					
Step 5: Evaluate Results and Suggest Changes					
_____ Teacher Approval					
_____ Modifying Model (If line is not marked, grade is lowered one full grade.)					

Points: 0 ÷ 5 = 0.00 Final Grade: _____ /50

Comments:

Project – Part 3: Pages becoming Squires (Machine, Testing & Observations)

One-Touch Start & Machines in a Series					
Three Simple Machines					
Medieval Appearance					
Other Group - Observations					
Other Group - Suggestions					

Points: 0 ÷ 5 = 0.00 Final Grade: _____ /50

Comments:

Project – Part 4: Knights Proposal to the Queen (Final Presentation)

1. Compound Machine

One-Touch Start					
Three Simple Machines					
Compound Machine in Series					
_____ Lever- 1st, 2nd, or 3rd Class					
_____ Inclined Plane					
_____ Wheel and Axle					
_____ Screw					
_____ Wedge					
_____ Pulley – fixed or movable					
Medieval Appearance					
Attains Goal					

_____ Stops at Princess Genevieve's Window

_____ Launches Beanbag through Window

2. Compound Machine (Extra Credit)

Storm or Save:					

_____ Safely Returned Princess Genevieve to the Ground

_____ Hit King Snores O'Lot

Additional Compound Machines:

One-touch Start					
Three Simple Machines					
Compound Machine in Series					
Attains Goal					
Middle Ages Costumes					
Other:					

3. Final Presentation Plan

Accuracy					
Following Directions					
Completion					

_____ Presentation Preparation (If line is not marked, grade is lowered one full grade.)

4. Final Presentation – Content

Introduction					
_____ Greeting Queen					
_____ Knights Names					
_____ Name of Guild					
Compound Machine					
_____ One-touch Start					
_____ Series Description					
_____ Attainment of Goal					
How does the each Simple Machine make work easier?					
Simple Machines Identification					
1st - _____					
2nd - _____					
3rd - _____					
Medieval Perspective					
Is the machine realistic to the Middle Ages?					
How would this machine function in the Middle Ages?					
Technological Design					
What did you learn from the test?					
How did you fix the problems?					
Visual Aid					
Sketch or Photo					
Labels					

5. Final Presentation – Format					
All Members Participate					
Eye Contact & Not Reading					
Professionalism					
Volume					
Overall Preparedness					

Points: 0 ÷ 26 = 0.00 Final Grade: _____ /200

Comments:

Project: Group Work & Class Participation

Technological Design					
Model – Original & Modified Construction					
Presentation Planning					
Presentation Preparation					
General Working Attitude					

Points: 0 ÷ 5 = 0.00 Final Grade: _____ /50

Comments:

Science and Technology Reflective Paragraph

NAME: _____ PERIOD: ____
DATE: / / DUE DATE: / /

Directions: Write a paragraph using your experiences within this unit to explain how science and technology are related. You may reread your ScienceSaurus and review your Mini-Activity: Science and Technology to help get your mind working. You may choose to discuss any aspect of science and describe how it has been and continues to be affected by technology, or vice versa. For example, you could discuss computers, robotic arms, any appliance, etc. Once you have completed the writing organizer below, type your paragraph following the paragraphing requirements and then staple the paragraph to this paper.

TOPIC: Write a sentence about your **topic**. Explain what your topic is and how your topic shows the relationship between science and technology!

_____

_____

FACTS: Find 3 facts about your topic. These do not need to be in complete sentences. These facts should relate to some part of your topic. Examples: Science Advancements, Technology Developments, Changes in Technology, Science Changes, etc.

1. _____ 2. _____ 3. _____

EXPLAIN: Write a sentence which **explains** each fact. Make sure to explain the aspect of the trick, the main idea of physics, and how they relate to each other.

1. _____ 2. _____ 3. _____

_____ _____ _____

_____ _____ _____

Conclusion: Write your conclusion sentence which summarizes your facts and relates to your topic sentence. Make sure to add something special to make your conclusion excellent!

_____

_____

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Unit #5

Science and Technology Reflective Paragraph

Name:_____

Period: _____ Date: / /

Unit Assessment

	3	4	5	6
FOCUS ☐ Your work does not respond to the prompt.	❑ No clear topic ❑ Topic is not maintained. ❑ Most information does not relate to topic. ❑ Paper has no closing.	❑ Topic is present. ❑ Topic is minimally maintained. ❑ Some information relates to topic. ❑ Paper has ineffective closing.	❑ Topic is clear. ❑ Topic is adequately maintained. ❑ Most information relates to topic. ❑ Paper has adequate closing.	❑ Topic is very well defined and structured. ❑ Topic is very well maintained. ❑ All information relates topic. ❑ Paper has effective closing.
ORGANIZATION	❑ Paper does not follow a logical plan or order. ❑ Few or no transitions. ❑ Sections missing: ___ Introduction ___ Body ___ Conclusion	❑ Some points of the paper follow a logical plan or order. ❑ Some transitioning present ❑ Includes a minimal: ___ Introduction ___ Body ___ Conclusion	❑ Most points of the paper are logically presented and related. ❑ Adequate transitioning ❑ Includes an appropriate introduction, body, and conclusion	❑ All points of the paper are logically presented and related. ❑ Smooth and original transitioning ❑ Includes an excellent introduction, body, and conclusion
SUPPORT ☐ Inaccurate support	❑ Unclear/no supporting ideas	❑ Minimal supporting ideas	❑ Adequate supporting ideas	❑ Detailed supporting ideas
CONVENTIONS ☐ No proofing evident	No Points Many errors in grammar and syntax: ❑ Spelling ❑ Punctuation ❑ Sentence Structure ❑ Capitalization	Plus One Few errors in grammar and syntax: ❑ Spelling ❑ Punctuation ❑ Sentence Structure ❑ Capitalization	Plus Two Minimal or no errors in grammar and syntax	

Total Points _____/20 Conversion Average _____/4 Final Grade: _____/100

Point values: 19-20 =4 (exceeds) 16-18 = 3 (meets) 14-15= 2 (does not meet) below 14 = 1 (academic warning)

Group #	Who worked on the Project?	Who helped you?	How much did it cost?	How did the construction go?	Phone Number	Compound Machines
						Series: ____ One-touch: ____ 3 Machines: ____ Appearance: ____
						Series: ____ One-touch: ____ 3 Machines: ____ Appearance: ____
						Series: ____ One-touch: ____ 3 Machines: ____ Appearance: ____
						Series: ____ One-touch: ____ 3 Machines: ____ Appearance: ____
						Series: ____ One-touch: ____ 3 Machines: ____ Appearance: ____
						Series: ____ One-touch: ____ 3 Machines: ____ Appearance: ____
						Series: ____ One-touch: ____ 3 Machines: ____ Appearance: ____

Interdisciplinary Project:

Unit Evaluation

Name: _____
Period: _____ Group #: _____
Date: / / Due Date: ____ / /

Self and Group Work Evaluation

1. What was the topic of this unit? _____
2. What did you learn in this unit? _____

   _____
3. Throughout the unit, why were you a good team member? What did you do or say?

   _____

   _____
4. Next time you work in a group, what could you do better in your group? What could you do or say differently?

   _____

   _____
5. In the chart below, rate yourself and your group members.
   0 – Did Not Participate
   1 – Participated and Contribute Less than His/Her Fair Share
   2 – Participated and Contributed His/Her Fair Share
   3 – Participated and Contributed More than His/Her Fair Share

Group Member's Name	Technological Design Helping to complete the technological design packet. Sharing ideas and keeping up with the group.	Model Helping to construct the model and make physical changes to the model. Bringing supplies or contributing financially.	Planning of the Presentation		Comments List a few words describing this group member's attitude during the process of working together.
			Completing the presentation plan.	Making the visual aid and note cards or typing a speech.	

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Self-Evaluation

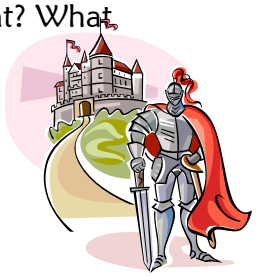
There are many grades for this unit. Look at the list of assignments below and write the grade that you believe that you earned in this project.

- Project – Part 1: Apprenticeship with the Master
  - Mini-Activity: Machines……
  - Mini-Activity: Machines – CHALLENGE……
- Project – Part 2: Working within the Guild
  - Technological Design Packet……
- Project – Part 3: Pages becoming Squires
  - Machine……
  - Observations and Suggestions of Other Groups……
- Project – Part 4: Knights Proposal to Queen
  - Presentation Plan……
  - Presentation……
  - Final Machine……
- Project: Group Work & Class Participation……

Goal Setting

Every experience allows us the opportunity to learn and grow. Hopefully, you learned a little more about science, working with others, and yourself in this unit. We have one additional unit this year. Before beginning this unit, take a few minutes to set goals for yourselves.

1. In the next unit, I would like to earn the following average grade……
2. What should I do to earn this grade? What will help be to earn the grade I want? What can I change about my actions for Unit #2?



_____

_____

_____

_____

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