

Technology

Content Area: **Science**
Course(s): **Science 4**
Time Period: **Undefined**
Length: **Undefined**
Status: **Published**

Unit Overview

Essential Questions

How does technology affect our lives?

What is technology?

What is the design process?

Content

Technology is the knowledge, processes, and products that solve problems and make work easier.

The design process is a set of steps for developing products and process that solve problems.

Skills

Understand how technology solves problems and makes work easier.

Use the design process.

Assessments

Apply the steps of the design process to design a product that solves a problem.

Study Guide

Chapter Review

Chapter Test

Benchmark Practice

Lessons/Learning Scenarios

Day 1: What is Technology? (Lesson 1)

- Think-Pair-Share what technology is (a definition, not examples)Project purpose: Students track evolution of this piece of technology and evaluate changes of usefulness. Students also become more acquainted with text features and reading strategies and will eventually cite evidence from the text for part of the project. At the conclusion of reading the book- students will work with a partner (in that group) to draw a picture timeline of the changes for that piece of technology. The final piece of the timeline will be a drawing of how they image that piece of technology looking ten years from now. Students will use grade appropriate sensory/words, adjectives and verbs to describe the capabilities of the technology and cite evidence from the text for the advancement.
 - Discuss as a whole group.
 - Students work in pairs to come up with one piece of technology they use often (doesn't have to be in school)
 - Pairs will write the name of the technology on a piece of paper.
 - Random pairs, or a member of the pair, will be selected to come up and give adjectives describing that piece of technology for the other pairs to guess what it is.
 - Evaluate why technology is important in our lives.
 - Students will be placed in small groups and around the room at each station will be a picture of an object or an area. Each group will be given a different colored marker. Students are to work in their groups to write next to the picture the various pieces of technology that area or object has.
 - Review and evaluate if what was written is technology (as whole group)
 - Documenting the evolution of technology project...
 - Students will be divided by either guided reading groups or interest groups and be given a Reading A-Z book on a piece of technology.
 - Teachers will each work with a group that would benefit from teacher support/guidance
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 - Students will begin reading the book with his/her group.

*Materials: Paper, Pencils, Technology Pictures, Various Colored Markers/Colored Pencils, Laptop, Projector, LUNA, Reading A-Z Books, Group Formation, Project Directions/Project Paper

Day 2: What is Technology? (Lesson 1- continued)

- Students finish reading the book in their groups.
- Students will work with a partner in their book group to create their timeline of evolution and future prediction with description.

*Materials: Pencils, Books, Project Directions/Project Paper, Colored Pencils/Crayons

Day 3: What is Technology? (Lesson 1- continued)

- Students will finish working with a partner in their book group to create their timeline of evolution and future prediction with description.
 - Students provide support from the text as to why they predict the technology will become this way.

*Materials: Pencils, Books, Project Directions/Project Paper, Colored Pencils/Crayons

Day 4: What is the Design Process? (Lesson 2)

- Whole Group, Student Led Discussion: We know what technology is but how did we get it? What steps did the inventor have to take to get to the product that we now have and use?
- Intro next activity- Suppose you are in charge of creating a new ride for Disney World, how would you know what to do or where to begin? How would you know it is safe?
 - Students will view Safari Montage video “Science of Disney Imagineering: The Design and Models” (runs 30 minutes 38 seconds)
 - Students will take notes on how Disney Imagineers design rides and what processes they follow.
 - Stop movie along the way to discuss the components of the design process.

*Materials: Laptop, Projector, Safari Montage, Paper, Pencils

Day 5: What is the Design Process? (Lesson 2 continued)

- Discuss what the design process is through the use of the Safari Montage video that the students previously viewed.
 - Have students compare notes with a partner and then discuss as a whole class.
 - Whole Group Class Discussion- Why is the design process important?
 - Students will be paired up (average/high – low grouping) and be given the steps of the design process. Using the textbook, students will read Chapter 2, Lesson 2 together and summarize how Orville and Wilbur Wright followed the steps of the process.
 - Review directions of the design process take home project.

*Materials: Student Notes, LUNA, Laptop, Projector, Design Process Organizer, Textbooks, Pencils, Take Home Project Directions

Day 6: What is the Design Process? (Lesson 2 continued)

- Students will finish working with his/her partner on summarizing the Wright brother’s steps of the design process.
 - Discuss together as a class upon completion
 - Discuss as class “Common Misconception” on Teacher Manual page 58.

- Complete together “Do the Math” on page 59 to tie in math with science and teach about elapsed time.

*Materials: Student Organizers on Design Process, Pencils, Textbooks, LUNA, Laptop, Projector, Differentiated Elapsed Time WS, Clock

Day 7: What is the Design Process? (Lesson 2 continued)

- Inquiry Explore It! Activity- How can the design of a model help you learn about the real thing?
 - Place students in strategic groups of three, if possible: “use first” Let Me Learn Technical, strong mathematics student, and “use first” confluence or sequential (whichever one is available)
 - Review parts of activity and review purpose of activity
 - Review measuring in inches
 - Explain to students the roles they have for this activity and the steps...
 - Step 1: Make the two airplanes (color the front tip of the plane)
 - Step 2: One person fly plane A all three times
 - Place tape mark down where person stands
 - This person tries to throw the plane the same speed each time (for consistent data)
 - Step 3: Second person measures from where the thrower was standing to where the tip of the plane is.
 - Review how to measure straight from where the person was standing to where the tip of the plane is.
 - Review measuring strategies.
 - Step 4: The third person records the measurements in the chart.
 - Step 5: After plane A is done its three trials- analyze the factors of the plane- what made it fly fast or slow? What features would you keep for another plane? What would you change? Students document this for when they design their own plane.
 - Step 6: Repeat all steps again, except fly plane B instead.

*Materials: Paper Airplane Templates, Scissors, Ruler, Lab Organizer

Day 8: What is the Design Process? (Lesson 2 continued)

- Instruct students on how to find the average or mean of the data (using calculators)
- Communicate the results of the activity
- Students will have a set amount of time to design a paper airplane that would travel the furthest (using their observations and prior knowledge from planes A and B).
- Students will fly their plane and measure to determine length of flight.
 - Discuss characteristics of “winning” plane

*Materials: Lab Organizer, Pencils, Calculators, Paper, Scissors

Day 9: Word Card Vocabulary Review For Chapter 2 (Encompasses all lessons)

- Students will be given one of the following Chapter 1 vocabulary words: technology, design process, and prototype; to use as the word on their “word card” (that will be put on an oversized index card). This will be counted as a grade!
- With this card, the students will have to complete the following tasks...
 - Illustrate/Provide a visual for the word
 - Finish the sentence stem pertaining to the word that requires the student to use the meaning in context correctly
 - Provide dictionary spelling
 - Articulate part of speech
 - Provide definition of the word
 - Find the word in a source other than the dictionary (could be textbook or have them search it on the computer)
 - Provide synonym for the word

*Materials: Science Textbook, Oversized Index Cards With Sentence Stem Already On It, Pencils, Crayons/Colored Pencils, Dictionary/Thesaurus, Laptop Cart?

Day 10: Language Arts/Social Studies Connection to Chapters 1/2 Content

- Out of the Social Studies and Language Arts Connections Book (a Pearson product included in the kit), do the following two activities with the students...
 - As a whole group, read the passage “Testing a Theory” (pages 2 and 3).
 - Review test prep strategies and complete questions on page 3 together.
 - Model how to find and/or infer answers from the text.
 - Model the practice of highlighting answers in the text.
- Place students in, ideally, groups of three and give them the passage “Safety in Science” (pages 4 and 5).
 - Students should each take a paragraph within the passage to read to the group and articulate which information is important.
 - Students will have the questions (on page 5) cut up. Each student will begin with randomly choosing one question. Each child is responsible for answering that one question and finding the answer or inference clues in the text. Students will check the answers together. Then, the children will choose one more question and follow the same procedure.
 - With extra time, until the class is ready to check as a whole group, students will take turns, within their group, underlining a word and providing a synonym for it and writing it on top of the word.

*Materials: Two Passages, Two Sets of Questions, Pencils, Highlighters, Colored Pen, LUNA, Laptop, Projector

Day 11: Knowledge Application Assessment Component (Encompasses all lessons)

- Student will take a written application of concepts assessment pertaining to this chapter.

*Materials: Pencils, Assessment

Standards

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|-------------------|--|
| SCI.3-4.5.1.4.B | Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims. |
| SCI.3-4.5.1.4.B.3 | Formulate explanations from evidence. |
| SCI.3-4.5.1.4.C | Scientific knowledge builds on itself over time. |
| SCI.3-4.5.1.4.C.1 | Monitor and reflect on one's own knowledge regarding how ideas change over time. |
| SCI.3-4.5.1.4.C.3 | Present evidence to interpret and/or predict cause-and-effect outcomes of investigations. |

Resources
