

The Technology of Paper Concept Storyline

Unifying Concept

An understanding of science and technology may be applied to the design and manufacture of products.

Unit Concept

Science and technology may be used in the design and manufacture of paper products.

Grade-Level Concept

The properties of paper serve as a basis for the design and manufacture of paper products. Testing may identify these properties.

Subconcept 1

Observations provide information about the properties of materials.

Lesson 1: Pre-Unit Assessment: Thinking about Paper

Students discuss what they know about paper and examine paper samples.

Lesson 2: Taking a Close Look at Paper

Students compare and describe wet and dry samples of paper.

Subconcept 2

Testing may reveal information on the properties of materials.

Lesson 3: Investigating the Properties of Paper: Part One

Students test six paper samples for tear-resistance.

Lesson 4: Investigating the Properties of Paper: Part Two

Students test paper samples for smoothness, opacity, and water and ink absorbency.

Lesson 5: Reviewing the Test Results

Students share and consolidate their test results.

Subconcept 3

Knowledge of the properties of materials helps develop strategies for their use.

Lesson 6: Recycling Paper by Hand

Students recycle one type of paper and discuss the variables that affect its properties.

Lesson 7: Examining Our First Piece of Recycled Paper

Students test the properties of their recycled papers.

Lesson 8: Investigating Variables in Our Recycling Process

Students focus on two variables in papermaking: the amount of fiber and the way the pulp is prepared.

Lesson 9: Recycling Different Kinds of Paper

Students explore how fiber type affects paper recycling and the properties of the paper produced.

Subconcept 4

Scientific and technological knowledge of the properties of materials may be used to design strategies for the manufacture of paper products.

Lesson 10: Experimenting with Our Paper-Recycling Process

Students test additional variables in the paper-making process.

Lesson 11: Exploring Additives

Students design and conduct a controlled experiment that demonstrates how additives affect recycled paper.

Lesson 12: Recycling Different Papers with Additives

Students develop a plan to test the effect of additives on five kinds of paper.

Lesson 13: Implementing Our Recycling Plan

Students carry out and discuss the plans they developed in Lesson 12.

Lesson 14: Paper Variations: Embedding and Embossing

Students explore additional ways to alter the properties of paper.

Lesson 15: Researching and Planning Our Design

Students create a design plan for a paper product.

Lesson 16: Implementing Our Design Plan

Students create their paper products.

Lesson 17: Evaluating Our Product and Presenting Our Results

Students evaluate their paper products and share their results with the class.

Lesson 18: Post-Unit Assessment: Sharing What We Have Learned about the Technology of Paper

Students discuss and reflect on what they have learned.