

PAPER MAKING 101

NOTE: best for K-6th grade although older age groups could experiment with various materials they collect in making paper.

2010 IDOE Content Standards

KINDERGARTEN Core Standards

Standard 1: Physical Science

Observe, manipulate, sort and generate questions about objects and their physical properties.

- K.1.1. Use all senses as appropriate to observe, sort and describe objects according to their composition and physical properties, such as size, color and shape. Explain these choices to others and generate questions about the objects.
 - K.1.2. Identify and explain possible uses for an object based on its properties and compare these uses with other students' ideas.
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Standard 1: History

Students examine the connections of their own environment with the past. They begin to distinguish between events and people of the past and the present, and use a sense of time in classroom planning and participation.

- K.1.4 Identify and order events that take place in a sequence.
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Standard 2: Civics and Government

Students learn that they are citizens of their school, community and the United States; identify symbols of the nation; and understand the importance of being a responsible citizen who knows why rules are needed and follows them.

- K.2.1 Give examples of people who are community helpers and leaders and describe how they help us. (Individuals, Society and Culture).
 - K.2.4 Give examples of how to be a responsible family member and member of a group. (Individuals, Society and Culture)
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Standard 3: Geography

K.3.3 Locate and describe places in the school and community.

K.3.6 Identify and compare similarities and differences in families, classmates, neighbors and neighborhoods, and ethnic and cultural groups. (Individuals, Society and Culture)

K.3.7 Recommend ways that people can improve their environment at home, in school and in the neighborhood.

Standard 4: Economics

Students explain that people do different jobs and work to meet basic economic wants.

K.4.2 Identify and describe different kinds of jobs that people do and the tools or equipment used in these jobs.

K.4.3 Explain why people in a community choose different jobs.

K.4.4 Give examples of work activities that people do at home.

GRADE 1 Core Standards

Standard 1: Physical Science

Describe objects in terms of materials that compose them and in terms of their physical properties.

- 1.1.1 Use all senses as appropriate to identify the component parts of objects and the materials from which they are made.
 - 1.1.2 Characterize materials as solid or liquid, investigate their properties, record observations and explain the choices to others based on evidence (i.e. physical properties).
 - 1.1.3 Experiment with simple methods for separating solids and liquids based on their properties.
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Standard 4: Science, Engineering and Technology

Determine properties of natural and man-made materials and their most important uses.

- 1.4.1 Use all senses as appropriate to sort objects as being composed of materials that are naturally occurring, human made or a combination of the two.
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Standard 1: History

Students will identify community and change in the different environments around them, including school and neighborhood communities, and identify individuals, events and symbols that are important to our country.

- 1.1.1 Compare the way individuals in the community lived in the past with the way they live in the present.
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Standard 2: Civics and Government

Students will explain the meaning of government; explain why rules and laws are needed in the school and community. They identify individual rights and responsibilities, and use a variety of sources to learn about the functions of government and roles of citizens.

- 1.2.1 Identify rights that people have and identify the responsibilities that accompany these rights. (Individuals, Society and Culture)
 - 1.2.2 Define and give examples of rules and laws in the school and the community
 - 1.2.3 Explain why rules and laws exist and describe the benefits of having rules and laws.
 - 1.2.4 Describe ways that individual actions can contribute to the common good of the community. (Individuals, Society and Culture)
 - 1.2.5 Describe what a citizen is and describe the characteristics of good citizenship. (Individuals, Society and Culture)
 - 1.2.6 Know the Pledge of Allegiance and understand that it is a promise to be loyal to the United States.
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Standard 3: Geography

Students will identify the basic elements of maps and globes and explain basic facts concerning the relationship of the sun to daily and seasonal weather. They will identify selected geographic characteristics of their home, school and neighborhood.

- 1.3.4 Identify and describe physical features and human features of the local community including home, school and neighborhood.
 - 1.3.9 Give examples of natural resources found locally and describe how people in the school and community use these resources.
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Standard 4: Economics

Students will explain how people in the school and community use goods and services and make choices as both producers and consumers.

1.4.1 Identify goods that people use.

1.4.2 Identify services that people do for each other.

1.4.3 Describe how people in the school and community are both producers and consumers.

1.4.5 Explain that people have to make choices about goods and services because of scarcity.

1.4.6 Explain that people exchange goods and services to get the things they want.

GRADE 2 Core Standards

Standard 1: History

Students will differentiate between events that happened in the past and recently, recognize examples of continuity and change in local and regional communities, and consider ways that people and events of the past and present influence their lives.

Identify individuals who had a positive impact on the local community. (Individuals, Society and Culture)

2.1.4 Identify and describe community celebrations, symbols and traditions and explain why they are important. (Individuals, Society and Culture)

Standard 2: Civics and Government

Students will explain why communities have government and laws, demonstrate that people in the United States have both rights and responsibilities, and identify individual actions that contribute to the good of the community and nation.

2.2.4 Describe how people of different ages, cultural backgrounds and traditions contribute to the community and how all citizens can respect these differences. (Individuals, Society and Culture.

2.2.5 Identify people who are good citizens and describe the character traits that make them admirable.

2.2.6 Discuss and explain the meaning of the Pledge of Allegiance and identify other ways citizens can affirm their citizenship.

Standard 3: Geography

Students will locate their community, state and nation on maps and globes; identify major geographic characteristics of their community; and explore geographic relationships between the physical and environmental characteristics of their community.

2.3.3 Compare neighborhoods in your community and explain how physical features of the community affect people living there.

2.3.7 Identify ways that recreational opportunities influence human activity in the community.

Standard 4: Economics

Students will describe how people in a community use productive resources, create a variety of businesses and industries, specialize in different types of jobs, and depend on each other to supply goods and services.

- 2.4.1 Define the three types of productive resources (human resources, natural resources and capital resources) and identify productive resources used to produce goods and services in the community.
 - 2.4.2 Identify community workers who provide goods and services for the rest of the community and explain how their jobs benefit people in the community.
 - 2.4.3 Explain that a price is what people pay when they buy a good or service and what people receive when they sell a good or service.
 - 2.4.5 Explain that because of scarcity, people must make choices and incur opportunity costs.
 - 2.4.6 Define specialization and identify specialized jobs in the school and community.
 - 2.4.7 Explain that income that people do not spend on goods and services is called savings.
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Standard 1: Physical Science

Observe and describe that the properties of materials can change, but not all materials respond in the same way to the same action

Standard 4: Science, Engineering and Technology

Describe how technologies have been developed to meet human needs.

- 2.4.2 Identify technologies developed by humans to meet human needs. Investigate the limitations of technologies and how they have improved quality of life.
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GRADE 3 Core Standards

Standard 2: Earth Science

Observe and describe how natural materials meet the needs of plants and animals (including humans).

- 3.2.6 Describe how the properties of earth materials make them useful to humans in different ways. Describe ways that humans have altered these resources to meet their needs for survival.
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Standard 4: Science, Engineering and Technology

Define a real world problem and list criteria for a successful solution.

- 3.4.2 Define the uses and types of simple machines and utilize simple machines in the solution to a “real world” problem.
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Standard 1: History

Students will describe how significant people, events and developments have shaped their own community and region; compare their community to other communities in the region in other times and places; and use a variety of resources to gather information about the past.

- 3.1.4 Give examples of people, events and developments that brought important changes to the regions of Indiana. (Individuals, Society and Culture)
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Standard 2: Civics and Government

Students will explain what it means to be citizens of their community, state and nation; be able to identify the functions and major services provided by local governments; use a variety of resources to gather information about their local, state and national governments; and demonstrate understanding of democratic principles and practices.

- 3.2.5 Explain the importance of being a good citizen of the state and the nation. Identify people in the state who exhibit the characteristics of good citizenship.
 - 3.2.6 Explain the role citizens have in making decisions and rules within the community, state and nation.
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Standard 3: Geography

Students will explain that simple grid systems (latitude and longitude) are used to locate places on maps and globes, and will begin to understand the Earth/sun relationship, identify the distinctive physical and cultural features of their community, and explain the geographic relationships within their own community with the state and other states within the region.

- 3.3.10 Use a variety of information resources to identify regional environmental issues and examine the ways that people have tried to solve these problems.
 - 3.3.11 Identify and describe the relationship between human systems and physical systems and the impact they have on each other.
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Standard 4: Economics

Students will explain how people in the local community make choices about using goods, services and productive resources; how they engage in trade to satisfy their economic wants; how they use a variety of sources to gather and apply information about economic changes in the community; and how they compare costs and benefits in economic decision making.

- 3.4.1 Give examples from the local community that illustrate the scarcity of productive resources. Explain how this scarcity requires people to make choices and incur opportunity costs.
 - 3.4.2 Give examples of goods and services provided by local business and industry.
 - 3.4.4 Define interdependence and give examples of how people in the local community depend on each other for goods and services.
 - 3.4.6 Identify different ways people save their income and explain advantages and disadvantages of each.
 - 3.4.7 Explain that buyers and sellers interact to determine the prices of goods and services in markets.
 - 3.4.8 Illustrate how people compare benefits and costs when making choices and decisions as consumers and producers.
 - 3.4.9 Gather data from a variety of information about a change that will have an economic impact on the community.
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GRADE 4 Core Standards

Standard 2: Earth Science

Describe how the supply of natural resources is limited and investigate ways that humans protect and harm the environment.

- 4.2.4 Investigate earth materials that serve as natural resources and gather data to determine which ones are limited by supply.
 - 4.2.5 Describe methods that humans currently use to extend the use of natural resources.
 - 4.2.6 Describe ways in which humans have changed the natural environment. Explain if these changes have been detrimental or beneficial.
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Standard 1: History

- 4.1.13 Identify and describe important events and movements that changed life in Indiana from the mid-twentieth century to the present.
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Standard 2: Civics and Government

Students will describe the components and characteristics of Indiana’s constitutional form of government; explain the levels and three branches of Indiana’s government; understand citizenship rights and responsibilities; investigate civic and political issues and problems; use inquiry and communication skills to report findings in charts, graphs, written and verbal forms; and demonstrate responsible citizenship by exercising civic virtues and participation skills.

- 4.2.6 Define and provide examples of civic virtues in a democracy.
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Standard 4: Economics

- 4.4.2 Define productivity and provide examples of how productivity has changed in Indiana during the past 100 years.
- 4.4.3 Explain that prices change as a result of changes in supply and demand for specific products.
- 4.4.4 Describe Indiana’s emerging global connections.
- 4.4.9 Identify important goods and services provided by state and local governments by giving examples of how state and local tax revenues are used.
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GRADE 5 Core Standards

Standard 1: History

Students will describe the historical movements that influenced the development of the United States from pre-Columbian times up to 1800, with an emphasis on the American Revolution and the founding of the United States.

- 5.1.1 Identify and describe early cultures and settlements that existed in North America prior to contact with Europeans. (Individuals, Society and Culture).

Standard 2: Civics and Government

- 5.2.8 Describe group and individual actions that illustrate civic virtues, such as civility, cooperation, respect and responsible participation. (Individuals, Society and Culture).
- 5.2.10 Use a variety of information resources to identify and evaluate contemporary issues that involve civic responsibility, individual rights and the common good.
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Standard 3: Geography

Students will describe the Earth/sun relationship and use global grid systems. They will identify regions; describe physical and cultural characteristics; and locate states, capitals and major physical features of the United States. They will also explain the changing interaction of people with their environment in regions of the United States and show how the United States is related geographically to the rest of the world.

- 5.3.7 Identify major sources of accessible fresh water and describe the impact of access on the local and regional communities.
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GRADE 6 Core Standards

Standard 1: History

Students will explore the key historic movements, events and figures that contributed to the development of modern Europe and America from early civilizations through modern

times by examining religious institutions, trade and cultural interactions, political institutions, and technological developments

- 6.1.15 Describe the impact of industrialization and urbanization on the lives of individuals and on trade and cultural exchange between Europe and the Americas and the rest of the world. (Individuals, Society and Culture).
 - 6.1.17 Compare the opportunities and dangers related to the development of a highly technological society.
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Standard 2: Civics and Government

Students will compare and contrast forms of government in different historical periods with contemporary political structures of Europe and the Americas and examine the rights and responsibilities of individuals in different political systems.

- 6.2.7 Define and compare citizenship and the citizen's role in selected countries of Europe and the Americas.
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Standard 3: Geography

Students will identify the characteristics of climate regions in Europe and the Americas and describe major physical features, countries and cities of Europe and the Western Hemisphere.

- 6.3.12 Compare the distribution of natural gas, oil, forests, uranium, minerals, coal, seafood and water in countries such as Brazil, Mexico, Canada, Great Britain and Russia.
 - 6.3.13 Explain the impact of humans on the physical environment in Europe and the Americas.
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Standard 4: Economics

Students will examine the influence of physical and cultural factors upon the economic systems of countries in Europe and the Americas.

- 6.4.9 Identify situations in which the actions of consumers and producers in Europe or the Americas create helpful spillovers or harmful spillovers to people inside a country who are not directly involved in the consumption or production of a product.
 - 6.4.10 Explain how saving and investing help increase productivity and economic growth and compare and contrast individual saving and investing options.
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Standard 3: Life Science

Describe that all organisms, including humans, are part of complex systems found in all biomes (i.e., freshwater, marine, forest, desert, grassland and tundra)

Understand that the major source of energy for ecosystems is light produced by major nuclear reactions in the sun.

- 6.3.5 Describe how all animals, including humans, meet their energy needs by consuming other organisms, breaking down their structures, and using the materials to grow and function.
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