

Erasmus+ Cultural connections : Enhancing EU heritage, Social Inclusion and Digital Literacy through our Pupils' hearts
Scientific and Creative Thinking Workshop
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SCIENTIFIC EXPERIMENT 1.12

Recycling Paper: From Waste to New Material

Type of Activity

Experimental science activity with transdisciplinary applications (Science, Ecology, Art, Civic Education)

Target Age Group

Primary or lower secondary students (adaptable for older students with added variables)

Learning Objectives

Scientific Objectives

Students will:

1. Understand that paper is made from plant fibers (cellulose).
2. Observe how cellulose fibers can be reused through mechanical processing.
3. Identify the stages of a material transformation process: soaking, pulping, filtering, pressing, and drying.
4. Develop basic experimental skills: observation, sequencing, and cause–effect reasoning.

Transdisciplinary Objectives

Students will:

1. Develop ecological awareness by understanding recycling as a method of resource conservation.
2. Express creativity by designing recycled paper with colors, textures, or natural inclusions.
3. Practice collaboration, responsibility, and respect for shared resources.
4. Strengthen fine motor skills and procedural discipline.

Research Question

Can used paper be recycled and transformed into new paper using water, mechanical processing, and drying?

Hypothesis

If used paper is soaked in water and mechanically processed, then its fibers can be recombined to form a new sheet of paper after filtering, pressing, and drying.

Materials

- Used paper (newspapers, notebooks, scrap paper)
- Water
- Container or basin
- Blender or manual tearing (age-appropriate)
- Sieve or mesh screen
- Absorbent cloth or sponge
- Heavy books or press
- Flat drying surface

Optional: natural dyes, flower petals, leaves, threads

Experimental Procedure

1. **Preparation**
Tear used paper into small pieces and place them in a container with water.
2. **Soaking**
Allow the paper to soak until it becomes soft and fibrous.
3. **Pulping**
Mix the soaked paper mechanically to separate the fibers and form pulp.
4. **Filtering**
Pour the pulp onto a sieve and spread it evenly to form a thin layer.
5. **Pressing**
Remove excess water using a cloth or sponge, then apply pressure.
6. **Drying**
Leave the paper to dry completely on a flat surface.

Observations

Students observe:

1. Changes in texture and structure of the paper
2. Water absorption and fiber separation
3. Formation of a continuous sheet from loose fibers
4. Differences between original and recycled paper

Results

A new sheet of recycled paper is obtained, demonstrating that paper fibers can be reused through a physical transformation process.

Conclusion

The experiment confirms that paper recycling is possible using simple physical methods. No new raw materials are required, only water, mechanical action, and time. This demonstrates an important principle of sustainable material use.

Transdisciplinary Connections

Ecology and Environmental Education

- Highlights the importance of reducing waste and saving trees
- Encourages responsible consumption and recycling habits
- Introduces concepts of sustainability and circular economy

Art and Creativity

- Recycled paper can be decorated or customized
- Students explore texture, color, and design
- Connects science with visual expression

Civic and Social Education

- Promotes teamwork and shared responsibility
- Builds awareness of individual impact on the environment
- Encourages active citizenship through small, meaningful actions

Skills Development

1. Fine motor coordination
2. Following scientific procedures
3. Problem-solving and reflection

Extension Activities

- Compare thickness or strength of recycled paper samples
- Test different paper types (newspaper vs. notebook paper)
- Write or draw on the recycled paper
- Create an ecological poster or artwork using the recycled sheets

Name: _____ Date: _____

Experiment

Write the name of your experiment in the blank space above. Then, complete the rest of this page with information about your experiment.



Question: What are you testing?

Hypothesis: What do you think will happen?



Observations: What happened during the experiment? Draw a picture or record data below.



Conclusion: What conclusions can you draw based on the results of your experiment?

Observation sheet source: WeAreTeachers, 2024