

Erasmus+ Cultural connections : Enhancing EU heritage, Social Inclusion and Digital Literacy through our Pupils' hearts
Scientific and Creative Thinking Workshop
7-12 December 2025, Ukmerges, Lithuania



Co-funded by
the European Union

SCIENTIFIC EXPERIMENT 6.12

Experiment Title

Cotton vs Synthetic Sports Fabric Extended Experiment: Fabric Drying Under Different Conditions

Type of Activity

Inquiry-based scientific experiment comparing textile materials under varying environmental conditions to understand drying time, comfort, and health implications

Grade Level

Ages 9–14 (upper primary / lower secondary)

Learning Objectives

Scientific Objectives

Students will be able to:

1. Compare physical properties of cotton and synthetic fabrics.
2. Measure and compare drying time under different conditions.
3. Explain evaporation in relation to temperature and airflow.
4. Identify independent, dependent, and controlled variables.

Interdisciplinary Objectives

Students will be able to:

- **Physics:** Explain evaporation and heat transfer.
- **Biology / Health:** Understand thermoregulation and cooling.
- **Civic / Life Education:** Make informed clothing choices.
- **Mathematics:** Measure time, organize data, compare results.
- **Language:** Communicate conclusions using scientific reasoning.

Research Questions

1. *Which fabric dries faster: cotton or synthetic sports fabric?*
2. *How do temperature and airflow affect drying time?*

Updated Hypotheses

1. Synthetic fabric will dry faster than cotton under all conditions.
2. Higher temperature and increased airflow will reduce drying time for both fabrics.
3. Airflow will have a stronger effect on drying time than temperature alone.

Materials

1. Cotton fabric sample (same size)
2. Synthetic sports fabric sample (same size)
3. Water (measured quantity)
4. Measuring cup or spoon
5. Timer or clock
6. Fan (for airflow condition)
7. Two locations:
 - a. Room-temperature area
 - b. Warm area (radiator at a safe distance, sunny window or warm room)
8. Observation worksheet

Variables

- **Independent Variables:**
 - Fabric type (cotton / synthetic)
 - Environmental condition (temperature and airflow)
- **Dependent Variable:**
 - Drying time (minutes)
- **Controlled Variables:**
 - Fabric size
 - Amount of water
 - Surface used
 - Starting time

Experimental Procedure

1. Place both fabric samples on a flat surface.
2. Pour the same amount of water onto each sample.
3. Assign samples to one of the following conditions:
 - Room temperature, no airflow
 - Room temperature, airflow (fan)
 - Warm area, no airflow
 - Warm area, airflow
4. Start the timer.
5. Check the fabrics every 5 minutes.
6. Record when each fabric feels dry.

Experimental Design (Conditions)

Students test **four conditions**:

Condition	Temperature	Airflow
A	Room temperature	No airflow
B	Room temperature	Fan
C	Warm	No airflow
D	Warm	Fan

Each condition is tested with:

- Cotton fabric
- Synthetic fabric

Observation Table (Example)

Fabric	Condition	Drying Time (min)
Cotton	A	_____
Cotton	B	_____
Cotton	C	_____
Cotton	D	_____
Synthetic	A	_____

Synthetic B _____

Synthetic C _____

Synthetic D _____

Results (Expected Pattern)

1. Synthetic fabric dries faster than cotton in all conditions.
2. Both fabrics dry faster with airflow.
3. Warm + airflow = fastest drying.
4. Cotton benefits from airflow but still dries slower than synthetic.

Scientific Explanation

- **Temperature** increases evaporation by adding energy to water molecules.
- **Airflow** removes moist air from the fabric surface, allowing more evaporation.
- Synthetic fibers do not trap water, so evaporation happens more efficiently.

Evaporation increases with temperature and airflow. Cotton fibers trap water, slowing evaporation. Synthetic fibers allow water to evaporate more quickly due to reduced absorption and improved airflow.

Health and Practical Interpretation

- **Sports clothing** Synthetic fabrics are better for physical activity because they dry faster and help regulate body temperature (dry quickly, allow airflow, reduce cooling from wet fabric)
- **Health risk:** Wet cotton removes heat from the body, increasing the risk of chilling in cold or windy conditions. Proper sports fabrics help maintain stable body temperature.

Conclusion

Drying time depends on both material properties (fabric type) and environmental conditions (temperature, airflow). Synthetic sports fabrics combined with airflow provide the best conditions for staying dry and warm during physical activity.

Extension Questions (Higher Thinking)

1. Which variable had the strongest effect: fabric type, temperature, or airflow?
2. Why is airflow especially important during sports?
3. How does sweating connect to this experiment?

Interdisciplinary Connections

Physics (Evaporation, Heat transfer), **Biology / Health** (Thermoregulation, Hypothermia prevention), **Civic / Life Education** (Self-care and health decisions), **Mathematics** (Time measurement, Data comparison tables), **Language** (Scientific explanation, Argumentation)

Safety Notes

- Do not place fabrics too close to heat sources.
- Do not wear wet fabrics during the experiment.
- Ensure fans are used safely.

Reflection Questions

1. Which variable had the greatest effect on drying time?
2. Why is airflow important during sport?
3. How can clothing choice affect health?

Student Observation Worksheet

Which Fabric Dries Faster? Cotton vs Synthetic Sports Fabric

Name: _____

Date: _____

Class: _____

1. Experiment Title

Which Fabric Dries Faster? Cotton vs Synthetic Sports Fabric Under Different Conditions

2. Research Questions

1. Which fabric—cotton or synthetic—dries faster?
2. How do temperature and airflow affect drying time?

3. Prediction (Before the Experiment)

Complete the table and explain your prediction:

Fabric	Condition	Prediction: Will it dry faster or slower?
Cotton	Room temp, no airflow	_____
Cotton	Room temp, airflow	_____
Cotton	Warm, no airflow	_____
Cotton	Warm, airflow	_____
Synthetic	Room temp, no airflow	_____
Synthetic	Room temp, airflow	_____

Synthetic Warm, no airflow

Synthetic Warm, airflow

Explain your reasoning:

4. Materials Used

Circle the materials you used:

1. Cotton fabric
2. Synthetic sports fabric
3. Water
4. Measuring cup / spoon
5. Timer
6. Fan
7. Thermometer
8. Flat surface / tray
9. Observation worksheet

5. Observation Table

Record the drying time for each fabric in each condition.

Fabric	Condition	Time until dry (minutes)	Notes / Observations
Cotton	Room temp, no airflow	_____	_____
Cotton	Room temp, airflow	_____	_____
Cotton	Warm, no airflow	_____	_____
Cotton	Warm, airflow	_____	_____

Synthetic Room temp, no airflow _____

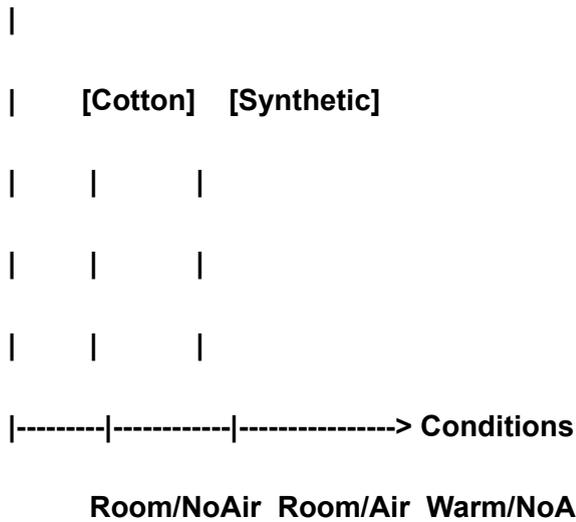
Synthetic Room temp, airflow _____

Synthetic Warm, no airflow _____

Synthetic Warm, airflow _____

Graph Layout

Drying Time (minutes)



6. Results Analysis

Answer the questions:

1. Which fabric dried faster overall?

2. Which condition helped fabrics dry fastest?

3. How did airflow affect drying time?

4. How did temperature affect drying time?

7. Scientific Explanation

Why did one fabric dry faster than the other?

8. Practical / Health Interpretation

1. Which fabric is better for sports or physical activity?

2. How can wet clothing affect your health?

9. Reflection Questions

1. If you had to choose clothes for running on a windy, cold day, which fabric would you choose? Why?

2. How could this experiment help you make better clothing choices?

10. Conclusion

Complete the sentence:

This experiment teaches me that the right fabric and environmental conditions help

Teacher Observation (Optional)

1. Student participated: Yes Partially No
2. Student understood the variables: Yes Partially Needs support

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